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NEWS IN BRIEF

Pascal package for Apple II

A PASCAL compiler has been announced for the Apple II as part of a complete package called "The Language System". Priced in the US at \$405, the package includes a 16K plug-in memory card, a 2K "Auto-start" ROM, and five diskettes containing Integer and Applesoft extended Basic in addition to Pascal.

Based on the UCSD language version, the compiler includes extensions tailored to the Apple's graphic and sound generation capabilities and requires a minimum 48K disc-based Apple II.

Dutch favour UK micro way

THERE are lessons to be learned for the Dutch Government in the approach to expanding the use and application of microelectronics taken by the UK Government. A Dutch study group, set up to look into the potential social impact in Holland, has been impressed with efforts made so far, though it also points to the lack of attention given in the UK to potentially negative social consequences.

APL utilities

THE latest APL products from Cocking and Drury include a PERT package that runs on a 64K IBM 5110 and a set of workspace documentation utilities. The utilities, priced at £500, provide means of tracing the structure of functions in a workspace and are available for VS/APL, APL/SV and Xerox APL.

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Royal date for Cray forecaster

THE distinctive shape of the Cray 1 supercomputer will be subject to Royal gaze tomorrow. Friday, when the European Centre for Medium Range Weather Forecasts at Shinfield Park near Reading is formally opened by Prince Charles.

The Cray 1 will analyse meteorological observations that have been decoded and stored by a Cyber 175 which fronts ends the machine. The Cray 1 will provide forecasts covering periods up to 10 days ahead for the 17 European countries participating in the ECMWF project.

Cray Research is now bidding against Burroughs, CDC and ICL for a contract from the Meteorological Office at Bracknell for a supercomputer to handle long range weather forecasts, part of the Met Office's contribution to the World Climate Programme of the World Meteorological Organisation (CW, February 8).

Cray Research UK has just appointed a new managing director, David O'Brien, who was formerly public sector business manager with IBM Europe.

He succeeds Peter Appleton Jones, who has been elected vice-president, marketing at Cray Research in Minneapolis.

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Downtime

by Chad

Fifty-shilling firmware?

THOUGH it is something I would rarely admit to my intellectual friends, I sometimes read magazines about trains. Ah, I say to myself, the awesome power of steam — God bless ancient technology!

But in a recent issue of Modern Railways, the dredged chisel reared its ugly head yet again (will never be free of them?). With horror I recalled, shocked by such contamination of "engineering" on the grand scale by "technology" on the small. Until, that is, I spotted the following statement, which may well provide us with the answer to all our recruitment problems.

Talking of the current shortage of software engineers it says: "At present they are a highly mobile elite."

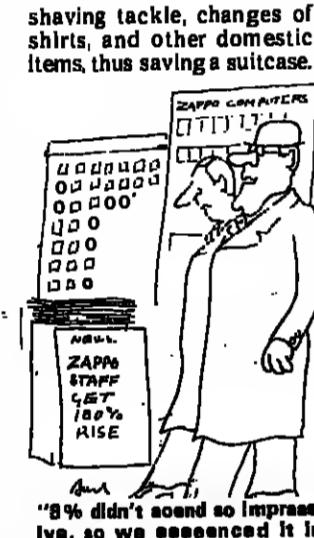
A suitable case...

MY colleague, Martin Banks, has discovered another new thing that can be done with microcomputers which can't really be achieved with a large mainframe.

In New Orleans recently, he happened to be standing next to Mike Markkula, chairman of Apple Computers, who had just finished demonstrating the Apple II micro.

"Watch this," says Markkula, "this thing makes a great suitcase." Off came the top of the Apple, in went an old towel to protect the circuit boards, followed smartly by a whole gamut of accessories and bits and bobs.

Markkula, apparently, has often used the Apple to carry



assiduously stalked by industrial headhunters.

"Perhaps the computer industry itself has been at fault here. In inventing the term 'software' it has apparently failed to invent an adequate definition capable of comprehension outside. Simply to say that 'software' is everything that is not hardware' is not enough. Many a prospective genius may have turned back on a career that sounds as if it has something to do with upholstery."

So that's it! All those clever school leavers think that computers are all about sewing and embroidery. It's wonderful how an outsider can provide one with a blinding flash of light to clear away one's problems. Excuse me while I rip off to stitch up the seams on my 3032.

The formula published in the new Tax Tables is not quite the same as the old one. The changes in logic are all explained in the Notes on PAYE for computer users issued by the Inland Revenue. The changes are designed to reduce the number of instances when there will be a discrepancy between the formula and the manual tax tables.

Making the program changes to meet the new specifications does not have to be achieved by any particular date, according to the Inland Revenue. We would, however, sound a warning. The new Chancellor will at some stage want to make radical changes to PAYE. Any changes required will be based on the new formula and a payroll programmer may find himself making two changes at the same time. This breaks the golden rule, "One change at a time."

Copies of the new tax tables, entitled "Specification for Computer Routines," and the Notes on PAYE for Computer Users —

By Cliff Dillaway



The first Budget of the new Chancellor has not affected payroll programs in substance, though some procedural changes have been announced. CLIFF DILLOWAY, an independent accounting and payroll consultant, explains.

Series 6 Number 1, are obtainable from Systems Unit, HM Inspector of Taxes, Centre 1, East Kilbride, Glasgow G79 1AA. Ask to be included on the mailing list. The notes include a small amount of test data.

There are really two National Insurance changes. The first flows from leaflet NPI5A dated January, 1979, an amendment to the Employer's Guide to National Insurance contributions.

Paragraph 117 of the guide now says that where the manual tax deduction cards are not used the pay records must show for each employee:

- employee's name
- employee's national insurance number
- contribution table letter
- date of payment
- the emoluments (excluding any allowable superannuation contributions)
- the amount of any allowable superannuation contributions
- the total of employee's and employer's contributions payable

These details are required for each pay period and we would expect to see them on the payroll. As in many computer systems the "payroll" is a carbon copy of the payslip at least some of the information above will be missing. The DHSS may think that it is reasonable to ask for this information to be available so that contribution amounts may be checked, but the provision of that much detail from a computer system may not be easy to achieve.

A subtle change is introduced by the instruction in NPI5A to delete the last sentence of paragraph 126 of NP15. This means that where an employee is paying NI contributions but not PAYE, the amount of earnings must now be shown on the manual deduction card. As this

Saturday Night Seizure — courtesy of a micro

COMPUTERS do not seem to help human relationships very much, but a real advance in this field may have been made by a young London programme who has devised a system to help match up people in disco. The equipment has already been used at the Sundown in Charing Cross Road and Busby's in Redhill, and has by all accounts been very popular with the Saturday Night Feverers.

Computer dating is not new; but its drawbacks are well known. Men are asked on their forms: "Do you like intelligent girls?" but what is the corresponding question to the girls? Hardly "Are you intelligent?" so it tends to be: "Do you like intelligent men?" and you end up with two stupid people, who nonetheless like clever people, matched with each other.

Steve Hilton's system aims to solve a much simpler problem: How do you approach strangers?

when you don't know whether they like the look of you? With the aid of a DIY micro and some special displays, Steve helps boys and girls to find out the opinions of others without embarrassment, which must be real human progress.

Everyone is issued with a

round badge carrying a number

and a blank card. They then go

around the room, noting down the numbers of those they like. In

other words, trying not to look

obvious. Then the cards are

handed to the computer operator,

who types all the numbers into

the VDU. Any two people who put down the same make a noise

and their numbers are displayed

to tell them to "get it together".

Steve Hilton's system also to

solve a much simpler problem:

How do you approach strangers?

Interface for mainframes, minis of different manufacturers

BIG computer users with mainframes and minicomputers from different manufacturers could be interested in a system called Hyperchannel, that enables different machines to share the same peripherals or exchange data at speeds up to 50 Megahertz per second over distances of up to 1,000 feet.

Hyperchannel is built in the US by Network Systems Corp of Minnesota and is now being sold in Europe by Teadata. It involves a common data highway or trunk to which different computers or peripherals are interfaced via microprocessor-controlled adapters. One trunk can have up to 84 adapters and a complete Hyperchannel system can have up to four trunks, although normally only one

trunk would be used, the others acting as fallback.

Each trunk consists of no-

thing more than a single TV type

c coaxial cable. Almost the

whole cost of the system is for

the adapters which are priced at

around £25,000 each, regardless

of whether they are intended to

a mainframe, a minicomputer or

a disc subsystem controller.

Adapters for different

machines differ only in the

microcode that provides the

capability to communicate with

the control logic of the particu-

lar CPU or peripheral. This

microcode is held on one PC

board. The rest of the circuitry is

common to every adapter and

includes buffer memory, control

logic, a communications inter-

face and the microprocessor.

—



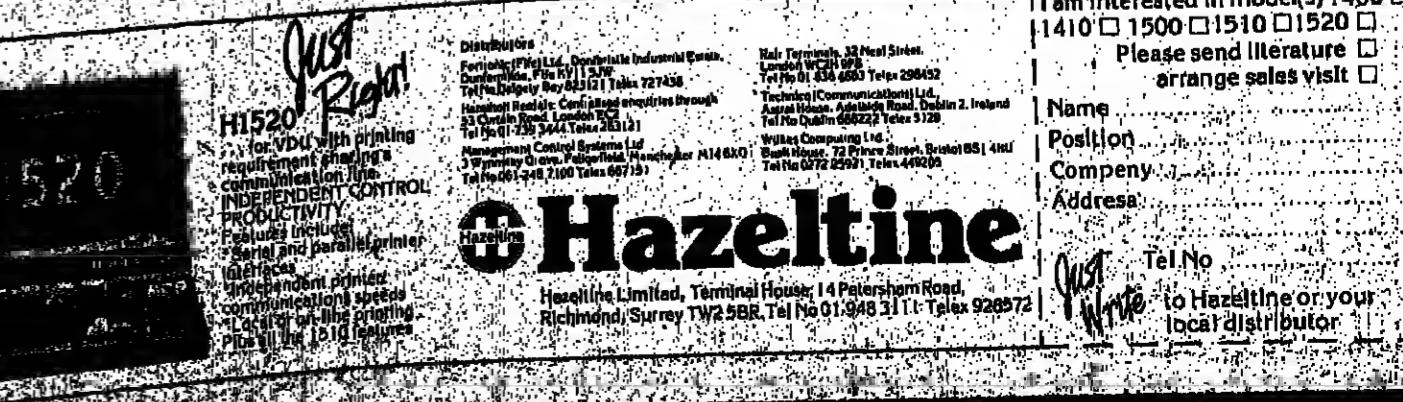
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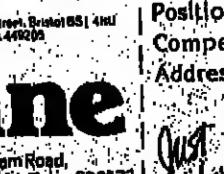
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GILB'S MYTHODOLOGY

How to specify maintainability goals for

soft system components

MOST experienced computer professionals are now well aware that maintenance of programs and databases is a very important problem.

The simplest measure of this is the current payroll cost of such maintenance, which is probably 40% of the programmer workforce.

The degree of maintenance ease for programs and files is, as in the case of machines, not a natural constant which we must tolerate. It is a result of the system design, or perhaps the lack of conscious design effort to make the system easily maintainable.

For this reason, many of us have decided that something must be done to improve the situation. The word has gone out: More maintainable programs! Other soft parts of the system, such as the files, are somehow often forgotten.

Someone shouts, "Structured". Someone else shouts, "Centralise the files: let us go database". Techniques of unknown value are thrown, at great expense, in the direction of ill-defined problems. The result is, of course, unpredictable, except that it is bound to be disappointing.

It is a generally accepted principle of business management and of systems engineering that we must start off with a clearly defined set of objectives. I believe that this applies to the design engineering of programs and files. We must state the levels and the types of maintainability which we propose to build into our soft system components.

I know, from personal investigation, that to specify a

realistic control over the design of maintainability.

In subsequent columns, I shall follow up by showing how to specify, and check for adequacy, a design to meet the maintainability levels we have specified. Table 1 shows a second level detailing of maintainability goals.

At the highest level of system goal specification, maintainability is specified on a level with other important system goals such as performance, delivery date, development cost, operational cost, portability, security and reliability, for example.

Many of these goals require a detailed breakdown if we want to ensure that the system designers understand them fully and provide for them. In the design specifications, security is one such goal.

TABLE 1: A second level detailing of maintainability goals.

	Worst case	Best case	Planned level
Problem recognition time	24 hours	1 min	60 mins
Administrative delay time	1 week	5 mins	60 mins
Tool and document collection time	1 hour	2 mins	10 mins
Problem analysis time	50 mins	30 secs	5 to 10 mins
Change specification time	1 hour?	30 secs	5 mins?
Active correction time	3 x problem analyse time	30 secs?	3 x problem analyse time
Local correctness test time	1 hour	5 mins	5 mins
Global correctness test time	1 day	?	100 x active correct
Independent change audit time	2 weeks (wait for)	Same hour	Same day, before use
Recovery from original problem time	Some day		2 hours

"How can I structure the program so that it will be easy for other programmers to read and understand?" But, as we can see from the list of maintainability goal areas, this is only a small part of the overall problem. In terms of time, it is not even significant to try to optimise this.

In some cases, such as an unexpected minor error, it may not even be desirable to carry out such an analysis at all. It may be more interesting to have "spare part" software available for immediate use, which does not contain exactly that minor fault. System programmers use this method every day at your site.

The breakdown which I have illustrated here is a close parallel to the breakdown of maintainability goals which will be found in conventional systems engineering textbooks.

The practically oriented reader will notice that this specification intentionally does not give any answers in terms of how to achieve these goals. Indeed, the technical design process may well reveal that some goals are unrealistic, and must be changed to more practical goals. We consciously limit ourselves to asking the right set of questions (or at least a better set than we are currently asking).

This is a language for system architects and system engineers. If you aren't prepared to speak it, then sooner or later your management must find someone who will.

Alarm over implications of errors

PROGRAMMER NOTES

IT is disturbingly easy to forget — when working on software at a low level — that one's system will ultimately take its place in a dangerous and demanding real world.

This blinkered view, which sees a programming error as an inconvenience rather than a potential cause of disaster, almost certainly stems from the historical predominance of batch processing applications.

While it may be expensive in stationary, a mistake on the in-house payroll will hardly likely to lead to sleepless nights — except perhaps for the analyst and programmer responsible.

Yet with the steady increase in real time and control applications, the potential ramifications of programming errors are beginning to assume alarming proportions.

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systems applications, providing exceptional tolerance to line deterioration; the 48 LSI-PP for point-to-point

operation over leased or dial-up circuits; the 48 LSI-FP

Fast Leam, with 25 ms equalisation time, for multi-point and

2-wire dial-up applications. Both have extensive built-in

diagnostic facilities and optional features such as remote

line testing.

What is Double Domino?

It is the modular technique that provides the ultimate in line performance, knocking spots off the competition.

borer

Borer Electronics Limited,
Fishponds Close, Wokingham RG11 2QJ, Berkshire.
Telephone: Wokingham (0734) 263372. Telex: 847352.

SOFTWARE FILE

SDL moves to integrate Coral 66 with Mascot

SEVERAL further steps toward the integration of Coral 66 with Mascot have been taken by SDI with the release of its microprocessor development system Context (CW, June 7).

Context conforms to the now familiar pattern of hosted microprocessor development systems, using the superior power and facilities of a minicomputer to support the development of microprocessor

A significant feature of this scheme is that even when running on the target, programs can continue to access the test files and simulators previously set up on the host. An evolutionary approach can thus be adopted to development, with live peripherals being taken in and checked out one by one.

Further, the programmer continues to enjoy the benefit of

full symbolic debugging. Interacting with the micro-resident program via a terminal attached to the host.

Both these facilities, generally referred to by SDI as up-line monitoring, are supported by the addition of a small communications module to the Mascot executive on the target.

On the host, the raw data returned by the target's communication module is translated back to the symbolic level via a program load map in conjunction with a stored representation of the Mascot ACP (Activity, Channel, Pool) diagram.

By checking, then, against the ACP file, Context can detect violations of the application definition. These are reported by the Mascot-extended compiler as compile-time errors.

SDL sees such facilities as these as one line of attack on the critical question of software quality control and assurance. The majority of errors, it argues, arise at the system level and can be largely eliminated by a Mascot bridge between system design and implementation.

As it is written in Cobol, it will run on any machine which has Cobol on it. It is currently running on an IBM 370 under DOS, and on four different Honeywell machines: a G115, a 2000 and two Level 64 machines, one under G115 emulation and

the other in native GCOS-64 mode.

If all the claims made for SpeedCobol stand up, one of the key attractions is the price: a \$5,000 one-time licence per site with one year warranty, plus an optional \$500 annual maintenance.

Minkler describes SpeedCobol as Cobol pre-compiler which can be used effectively within one hour of introduction, is self-documenting, and self-referencing, producing its own abbreviation-translation dictionaries, and completely table-driven.

It is designed to cut coding time in half, at the same time improving program quality through the use of more descriptive names.

It takes up about 30K bytes on the 370, and a good table occupies typically another 20 to 25K bytes.

It will be included in the next issue of the Honeywell software directory.

High speed ICL disc management

You know how the map of a disc can show a gradual deterioration of the layout. You may have noticed the machine slowing down in an attempt to access files. You know how long it takes to dump a security copy of disc (mainly because the whole file is dumped, not just the data). There is now a program which gives comprehensive disc management: ZAPP. You can evaluate ZAPP on free approval.

* Fast dumping of discs to mag tape, optionally to end of data — not end of file, thus saving time and space.

* Restructuring of discs, all files are compacted to the front of the disc, most free space is at the end.

* Transcription of one EDS type to another, e.g. EDS60 to EDS200. Files are reshaped — ideal for DME.

* Option to set size of output file to EOF value of input file.

* Runs on ICL1900s, 2903/4/5, DME, MEEP.

The outright purchase price of ZAPP is £385 plus VAT per site.

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21 Day Free Approval

ZAPP is available for 21 days — approval, free of any charge, or obligation.

Fill in the form opposite and return it to receive ZAPP plus documentation.

Please indicate if Cards or Paper Tape are required.

CHC Software Marketing Limited

59 Warborough Avenue, Reading, RG3 5LD

Yes, I wish to try ZAPP for 21 days. I understand that I am under no obligation to buy. If I am satisfied with ZAPP then you may invoice my Company for £385 + VAT after my 21 day evaluation period. If I decide not to keep ZAPP then I will post it back to you before 21 days have expired and you will not invoice my Company.

Cards Paper Tape required (please tick)

Name _____

Title _____

Company _____

Address _____

Versatile memory system

A NEW expansion memory system based around a new and flexible bus structure has been introduced by Intel. Known as the Series 80, the company claims that it can cope with a wide range of potential memory expansion requirements, as well as new memory technologies as they emerge.

The new bus structure, designated the BX bus, has been designed specifically for use in memory systems. It contains 24 address lines, four module address lines and a bus select function. The address lines allow addressing up to 16 Megawords for each memory module, of which there can be up to 16. The bus select function allows expansion to more than one BX-based system.

Word sizes ranging from 22 bits to 88 bits, without error correction, and 20 to 80 bits with error correction, can be accommodated by the bus.

Tandy revamps TRS-80 for small business market

IN a move away from the home computer market, Tandy is to launch a completely revamped version of its TRS-80 micro-computer system aimed specifically at the small business market.

Production of the new system, to be called the TRS-80 Model II, is scheduled to start in July, though it is unlikely to be available in the UK before February 1980.

The revamped hardware for the Model II is considerably reworked from the original system, which was aimed at a home market that, even in the US, is now

being doubted as a long term area of survival.

The major changes include the provision of an integral video display, rather than a separate monitor of the Model I. This will provide 80 characters per line in both upper and lower case.

It also features Integral 8-inch floppy disc drives, with up to three being possible, offering around 2M bytes of disc storage capacity. An optional bidirectional printer is also scheduled to be available for the new system.

Pricing of the hardware, though still to be finalised for the UK introduction next year, already looks competitive. Tandy in this country expects to be selling just one version of the Model II, equipped with

64K bytes of memory and three floppy disc drives, with an anticipated price between £4,500 and £5,500.

Marketing in the UK will not be through Tandy's existing network of audio equipment stores. The company is planning to open eight specialist outlets around the country, dedicated to selling and supporting both Model I and Model II of the TRS-80 range. Though none has been sited as yet, Tandy expects to have stores in most major cities, including London, Manchester, Leeds, Birmingham and Bristol.

September launch

TEN or 20M bytes Cromemco microcomputer system should be available in this country in September. Comer, the company's UK distributor, is currently evaluating a disc-based system that uses Winchester technology discs. Though pricing is not yet available, Comer expects a 64K byte system with 10M bytes of disc storage to cost about £8,500.

Will a £100 gamble find the perfect program?

AN idea that could lead to a software vetting service for personal computer users is to be tried on British programmers by Jerry Thompson, managing director of Shade Computer Services. And he is willing to

back the idea with £100 of his own money.

Thompson claims that the majority of software currently available for personal computer systems such as the Pet, Apple II and so on is not satisfactory.

He is offering the money as a prize to the writer of the first personal computer application program that he fails to crash within a week. He feels that it should be interesting to see whether programmers have enough faith in their products to take the gamble.

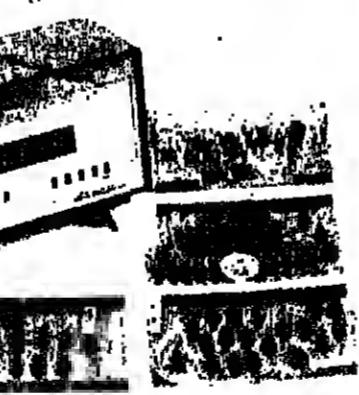
For the programs that are crashed, Thompson is willing to provide a short written report on why and where it happened, for a fee of £10. A more detailed report, giving methods of rectifying the faults in the programs, will also be available. But for this, Thompson will charge standard consultancy rates.

"I will be delighted if I have to pay out the £100," Thompson said last week at Shade's Cirencester, Wiltshire offices, "but there is a lot wrong with many current packaged programs, and their marketing."

"A £25 payroll program running on a £600 microcomputer is not the same as a £1,000 program running on a £6,000 machine. You don't buy a Mini and expect the appointments and performance of a Ferrari," he said. "However, much of the sales and marketing seems to indicate such statements as 'Syntax Error,' without a recovery routine."

Thompson hopes that his challenge will lead to the establishment of some form of permanent software vetting service, so that the general standard of programs available for microcomputer systems can be raised. He is himself aware that, no matter how good a programmer an individual thinks he is, some one else can nearly always find bugs in his programs.

Referring to Wiltshire's close association with meat, he said, "You don't buy bad meat from the same butcher twice." A succinct expression of his views on



Radiocode clock offers atomic accuracy standards

A NOVEL method of maintaining a constant time reference for computer systems, that does not suffer the vagaries of system downtime or power failure, has been developed by Circuit Services in Ruislip.

It brings to computing the accuracy associated with atomic time standards, and requires no intervention from computer room staff to operate.

Circuit Services' development, called the Radiocode

clock, is a fully self-contained electronic clock, referenced directly to a Caesium atomic clock in Rugby. The referencing is achieved by radio on a high-power 80kHz transmission from Rugby that can be received anywhere in the UK.

As the clock is continually referenced by radio to the atomic clock, and has an internal crystal for running without intervention by computer, no staff is needed.



THE FINANCIAL SOFTWARE COMPANY

Q. Who is MSA (Management Science America) Limited?

A. We are part of MSA Inc., a worldwide computer software company developing and supporting financial applications.

Q. What do we do?

A. MSA provides a complete range of application systems covering cash management, financial management and personnel management to more than 3500 companies around the world.

Q. How can MSA help you?

A. Whether you need to develop an entirely new system or whether your existing systems have reached the saturation point and must be rewritten, using a proven generalised software package will help you overcome the problems of:

Limited resources in your data processing departments. This will enable you to deliver the new systems without the need for additional people. Changing priorities in your business environment. You will be able

to deliver the systems you require without delay.

The communication gap between users and data processing. You can deliver the systems complete with all the necessary documentation and training.

Rising costs of data processing and systems development. You can deliver the systems for a known investment.

Q. What will this mean to you?

A. The use of a proven generalised software package will permit Immediate Implementation.

Q. What are the MSA application systems?

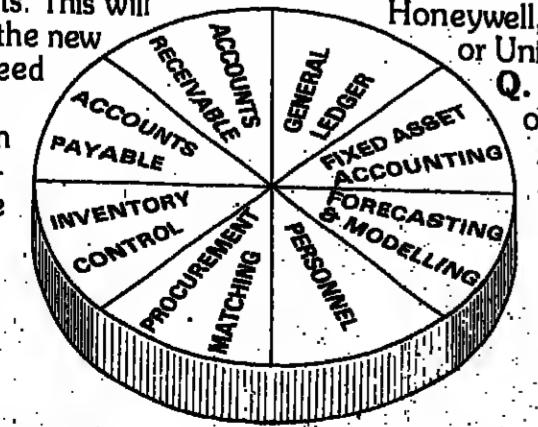
A. (see diagram).

Q. Who can use MSA?

A. Anyone in manufacturing, banking, insurance, building societies, distribution, transportation and Government utilising IBM, ICL, Honeywell, Burroughs, NCR or Univac hardware.

Q. How do you find out more?

A. Telephone Sue Spicer on Slough (0753) 70751.



MSA (Management Science America) Limited
1-9 Wexham Road, Slough, Berkshire SL1 1TP. Telephone: Slough (0753) 70751. Telex: 847400.

PO software rewritten by CDC enhances its European services

THE viewdata system sold by Insac to GTE in the US (CW, June 14), is significantly different from the Post Office Pre-set system on which it is based, and underlines the capability of Insac as an independent operator.

The Post Office software has

been entirely rewritten by Insac

to run on the Digital Equipment PDP-11 minicomputer, with appropriate billing and communications adaptations for the US market. The US software was designed by Insac itself, and coded by Insac member SDL.

The US system will operate with a full alphanumeric keyboard from the start, whereas the current version of Prestel is designed for numeric keypad, with alpha keyboard a subsequent optional enhancement.

Since CCITT has adopted the term Videotex as the generic name for Prestel-type systems, GTE has adopted Viewdata as the name for its service. Two US market trials are planned: a business service this summer, and a subsequent domestic trial.

The faa Viewdata system is

fully compatible with terminals used by

Insac users viewdata

signing up as information providers. However other people

close to the discussions indicate that the business service might be more oriented towards the Closed User Group concept, where a company uses viewdata as a means to distribute information to branch offices and so forth; applications like credit authorisation are also being considered.

For the residential market, ideas which have been considered include using viewdata to pay bills and carry out banking transactions, perhaps with terminals installed communally in apartment blocks rather than in the home. An obvious domestic application is working out personal taxation.

The use of a packet-switched

service such as Telenet or Tymnet to carry viewdata will make charges distant-independent, providing a framework for a national service.

Marketing of viewdata will be

handled jointly by GTE and Insac Viewdata Inc, yet another US Insac company. The latter will be offering in-house viewdata systems for companies which will be similar to the private systems offered by com-

panies like GEC and Philips in the UK. Insac will also promote

their local viewdata terminal.

The agreement with GTE

gives a big boost to the Post

Office standard for videotex

systems. Already adopted in

West Germany, Holland, Hong Kong and Austria as well as the

UK, it is close to becoming o

de facto international standard.

In addition to providing more capacity for European users, the new systems will also enable Control Data to provide more user software. A number of packages are currently available

only to US customers, and some of them will be modified and released in Europe over the next year.

Connection between the European centres in London, Brussels and Stockholm has been enhanced by the provision of an automatic switchover facility.

Other European centres are to

be linked into the network in the same way. The data centre at Rijswijk, Holland, is scheduled for connection before the end of the year, while the centres in Paris and Frankfurt will complete the enhancement during 1980.

Microforum Europe 79 opens at Wembley

BILLED as the most important microfilm event to be held outside the US, next week's Microforum Europe 79 at the Wembley Conference Centre, London, should have something to interest most computer users with a paper storage and retrieval problem.

The show runs from June 28 to 29.

Only a handful of organisations

offering computer

or a spate of individual processors

microfilm services will be

showing at the show, but most

of the COM recorder manufacturers will be there to talk to computer users who are thinking of investing in their own COM unit. There will also be a wide

range of other hardware designed

for COM users — like readers,

reorder printers and automated

retrieval systems.

Eurocom Data, the biggest

COM bureau in Europe, has taken

to stand at Microforum

to talk about its 24 hour turnaround service for converting magnetic tape

to microfilm or film, including its

72X reduction ratio service which

squeezes 600 pages on to a single

microfilm.

Datagraphix, the firm that

specialises in COM recording

equipment, will demonstrate its

low-cost Autorecorder in its

online and stand-alone versions

as well as the powerful Model 4860

COM configuration which comes

with its own tape drives, card reader and line printer.

Datagraphix competitor, NCR,

will demonstrate its 643-101

system

which can deliver individual processor

microfilm to film, including its

20M equipment amplifier,

Kodak, Bell and Howell and Agfa-Gevaert, will exhibit

render, retrieve systems and

duplicators.

On each of the first three days

of the show there will be a one-day seminar covering the basics of

of microfilm. It costs £48.50.

MEMOREX
MEMOREX

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The unique success story of the Memorex 1270 Communications Controller is

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get the best out of two great names in information handling: Memorex and IBM.

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12-nation speed-up on standards likely

STANDARDISATION of computing at an international level should be speeded up following an agreement on co-operation between the heads of 12 different national computing centres.

The directors, who met in Oslo, agreed to exchange information on the subject regularly to encourage a common approach, and to support national standardisation activities, particularly in the fields of programming languages, networks, and quality assurance for software.

David Farnberg, director of the NCC in the UK, was at the meeting, together with heads of corresponding organisations in such countries as France, West Germany, Japan, Spain and Italy.

The US was not represented, but two Communist countries, Hungary and Czechoslovakia, were.

An agreement on exchange of information and co-operation was also reached covering the area of the social impact of information technology. Each centre will appoint a "contact man" to look after information covering research projects and reports.

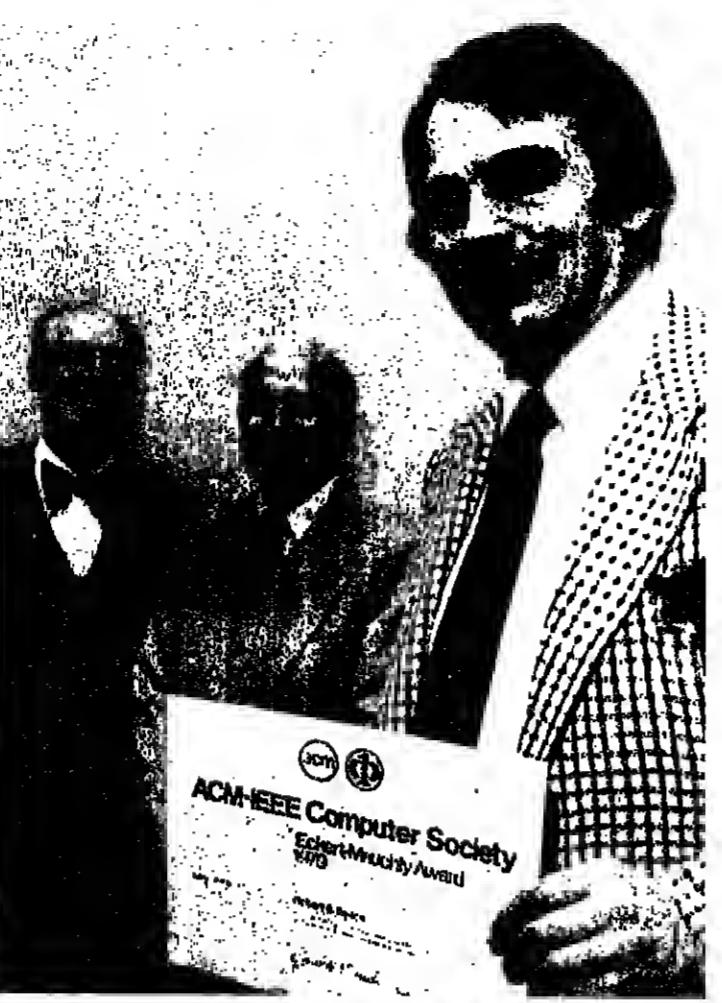
Recruitment firm sets up computer consultancy

A COMPUTER consultancy division has been added to the executive recruitment company, Peter Counsel.

The new company offers a variety of services ranging from guidance on equipment selec-

tion to a complete "turnkey" operation where required. The services are aimed at small and medium-sized businesses.

The consultancy operation will be headed by Derek Lightfoot, who is a former consultant



ACM award goes to Burroughs director

DIRECTOR of Systems Organisation Research at Burroughs, Robert Barton has become the first recipient of the Eckert-Mauchly Computer Architecture Award presented jointly by the Association for Computing Machinery and the IEEE Computer Society.

Barton has been with Burroughs for 25 years, and led the team that designed the B3000, the firm's first large machine and a trailblazer in the techniques of multiprogramming.

The award, which will be presented annually in recognition of achievement in the field of computer design, is named in honour of Presper Eckert and John Mauchly who designed and built ENIAC and UNIVAC I, the first American computers. They were in Philadelphia to present Barton with his certificate. It was nearby at the University of Pennsylvania in 1949 that ENIAC first started life.

In his citation Barton was described as having made computer systems "simpler to understand, simpler to engineer and construct, and easier to use, for everyone's benefit."

ICL makes debut at word processing show with the 7700

A NEWCOMER to the International Word Processing Exhibition this year will be ICL, which is demonstrating its new 7700 Information Processing System, combining WP and DP. By a link to a miniframe in Reading the firm intends to show an electronic mail facility working with the two 7700s on the stand.

The exhibition will be at Wembley Conference Centre from July 10 to 13, and among the 42 exhibitors will be most of the word processor manufacturers in Europe.

At the same time a series of half-day seminars is being run by Online on various technical and applications aspects of the busi-

ness, together with two whole-day conferences, one on "The people factor" and the other a look to the future, "The electronic office."

Topics covered by the seminars include an introduction for the first-time user, advice on selecting equipment, a review of the latest equipment, and WP supervision. Applications areas covered are three: the professions, the public sector and the financial sector.

To register for the exhibition, contact EETA at 109 Kingsway, London WC2B 3PU, and for the seminars, Online at Cleaveland Road, Uxbridge UB8 2OD.

Mostek memory boards could extend PDP-8 life

A NEW range of add-in memory boards has been introduced by Mostek that could greatly extend the working life of the faithful Digital Equipment PDP-8 computer.

Known as the MK 8000 family, it consists of five boards, offering 16K, 32K, 48K, 64K and 128K words of 12 bits each. As yet, UK pricing is not settled.

The family adds to the growing range of general purpose memory boards produced by Mostek, each of which makes use of the company's 200 nanosecond, 16K bit dynamic random access memory components.

There is some speculation that Mostek is considering using some of these general purpose boards to produce a replacement fixed head disc memory system, similar to that planned by Intel (CW, April 12).

A spokesman for Mostek said this week that the company is studying the fixed head disc marketplace, among others, but that no positive moves are planned at present.

Mostek last week realised nearly \$17.5 million from the sale of 750,000 shares on the US stock market. It seems likely that the money will be invested in the company's new NMOS wafer fabrication facility, being built in Colorado.

Danish president

AMDAHL European users have elected Ejner Dinesen as their president. The election took place in Copenhagen at the first meeting of the users group which was attended by 50 delegates.

Speakers included Amdaahl chairman Dr Gene Amadahl, and John Lovell, president of the Amdaahl users group in the US.

NEW TERMINALS FROM DIGITAL EQUIPMENT

In technical terms, they look very good...

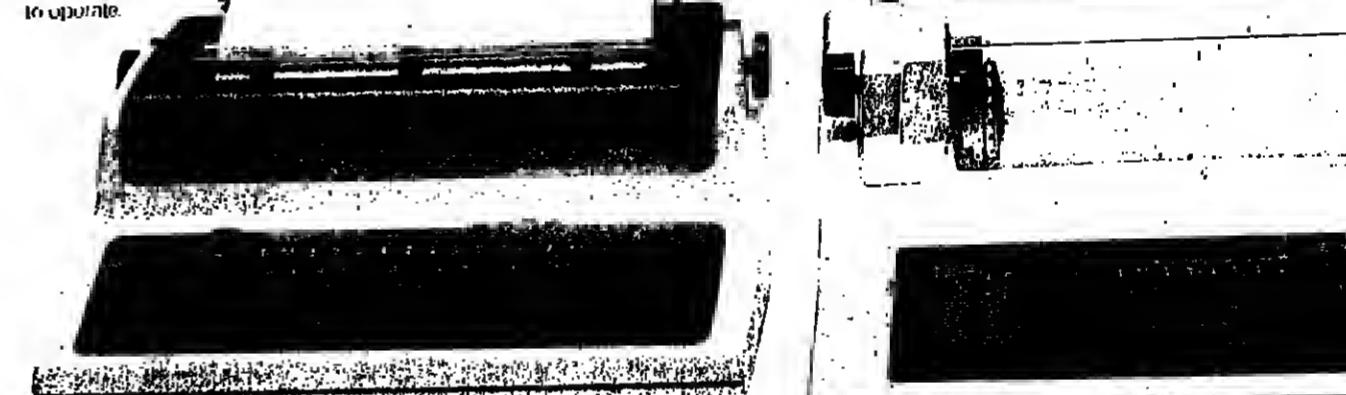
PDT-II Intelligent terminals. PDP-11 technology. Can be programmed, clustered, equipped with mass storage and used in synchronous or asynchronous networks. Shown is PDT-11/150 with floppy disk drive, intelligence and memory. Use with any keyboard terminal. Not shown: PDT-11/130 (with memory and tape storage), PDT-11/110 (intelligent terminal with memory), both incorporating VT-100 VTR/keyboard feature.



VT100/132. New video terminals. Up to 132-column width. Line-drawing capabilities. Up to 9600 baud rate. Exclusive "Slow Scroll" readability. Self-test diagnostics. Most functions sat from detachable (up to 2 m) keyboard. VT132 adds editing capabilities.



LA34. Tabletop DECwriter, 300 baud, 30 cps. Choice of 4 compressed fonts (10 to inch up to 16.5). Cartridge ribbon. Roll feed. Numeric pad option. Smaller and lighter than most standard typewriters and just as easy to operate.



LA120. High-performance terminal. Print speed 160 cps, baud rate selectable from 50 to 3,600 baud. More than 45 user-selectable features relating to printing and font matching. Choice of eight compressed fonts (from 5.5 to 16.5 to inch). Font size, tabs margin and form length can be set at keyboard. Standard for easy recall. Automatic self-test.



In human terms, they feel even better.

Suddenly, the broadest range of terminals in the industry has got even bigger.

Major introductions. New video terminals. New hard-copy terminals. A totally new family of programmable terminals (PDT-II).

Terminals you can quickly combine into a common communications network, because their control codes are all part of one carefully thought out intercompatible standard.

All offer a wide range of communications interface options. Customer assignable function keys. High commonality of parts, right down to standard IEC 435 line cord. All have switching regulators, for quieter, cooler operation. And for neater, more compact styling.

Human engineering specialists have colour-coded

each terminal to blend compatibly with the modern office environment. Keyboards are standard typewriter layout, with keys finger-sculpted and position-identified to maximise acceptability by any keyboard operator. Operator status lights are standard.

Still, these new terminals only represent a part of the total terminal family we have to offer. And if you haven't yet found out the advantages of dealing with the industry's only true "one-stop" terminal supplier, perhaps now is a very good time to find out.

We'll be very glad to send you data on all or any of these new terminals. And if you want to know more about existing terminals, like the well-known LA-180 line printer for example, just tick the "basket" box, too.

Digital, I'd like your Components Group to send me data on:

New video terminals New hard-copy terminals

New PDT-II programmable terminals I don't know

your full range, send me a complete basketful

Name _____

Title _____

Address _____

Telephone _____

Send to: Components Group,
Digital Equipment Co. Limited,
Digital House, Kings Road, Reading, Berks, RG1 4H4

digital

Digital Equipment Co. Limited



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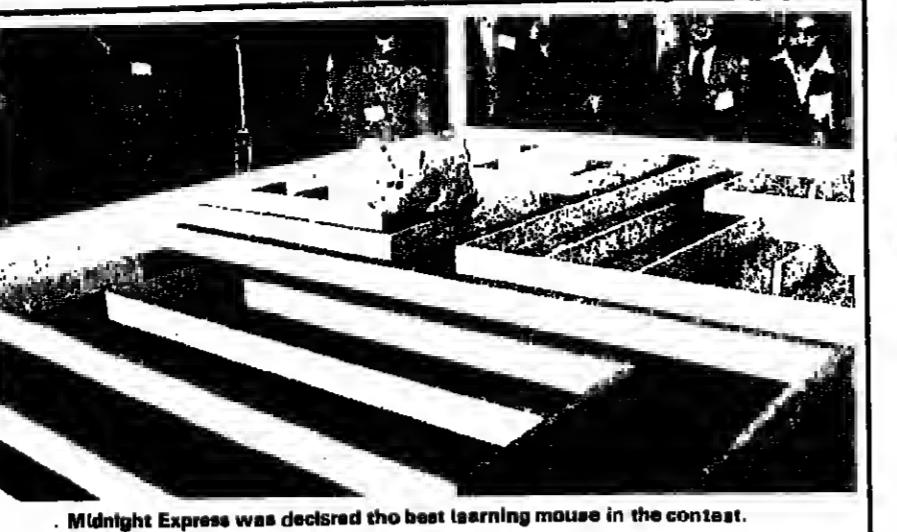
Of mice and men—and machines as well

THE Moonlight specials from the Bettelle Memorial Institute swept the maze board in the great Micro Mouse contest, which was one of the main attractions for visitors to the National Computing Conference in New York. It also proved to be a major event for many of the TV and newspaper journalists covering the show.

The contest started at last year's NCC and has been running throughout the year at various personal computer exhibitions. In the end, Moonlight Fish won the first prize of \$1,000 and Moonlight Express the prize for the best learning mouse.

The mice had to make their way through a maze. A few managed it. Some got lost and turned back. Most failed—or aborted, as the Americans say.

The competition was part of the personal computing fair which was run for the third time in parallel with the main NCC exhibition.



Midnight Express was declared the best learning mouse in the contest.

Micros shape DP's human face

"WE are introducing a David to challenge our own Goliaths," Univac president Richard Gehring told assembled journalists enjoying a plush breakfast at the Plaza Hotel when he introduced the new Univac 1100/60 series (CW, June 14). Meanwhile, elsewhere in New York, micro Davids were collecting their software stones and \$100 sling ready to challenge the entrenched computer industry and

computer professionals.

Gehring's reference to Univac's Goliath tried to span the pioneering computer work of J. Presper Eckert, who helped design Eniac, one of the first electronic computers, and who was present at the Plaza breakfast to witness the launch of a progeny of a power and capability beyond the dreams of 30 years ago.

But the 1100/60 is still part of

Malcolm Peltu looks at how the personal computing enthusiasts at the NCC in New York began teaching some old computer dogs some new human tricks

The industry tradition which was spawned by the early computers and is subject to the constraints imposed by having to satisfy an existing customer base with a heavy investment in software and resources.

The personal computer market, however, is unrestrained by the past. It is being propelled by the grandchildren of the pioneers; and it is starting where the traditional computer industry has too often ended—with the "real user".

The personal computer exhibition and conference at the NCC is put into perspective by its relation to the mainstream exhibition and conference. In its own right, the personal computer market is of limited interest to the general computer industry.

However, every computer product designer should carefully take note of the way in which the personal computer market has spawned systems with genuinely easy to use, human interfaces.

MORE NEWS FROM THE NCC — PAGES 18 AND 22

The Apple booth at the Hilton Hotel, for example, was alive with colour graphics and music synthesizers, with automated "paintbrushes" and odds to composers—and with the bread and butter small business packages which take an imaginative new light when dressed in human colours.

The importance of this human face of personal computing was vividly highlighted in a session in the main NCC conference on computing for chief executive officers. The panel included a professor from the Harvard Business School, business consultants and a vice-president from the Chase Manhattan Bank. Their view was generally pessimistic of the ability of chief executives to understand and use computers for their own applications in running the company.

Then, during question-time, personal computing guru Ted Nelson, author of Computer Lib, made the point that this gloomy view was a condemnation of the human engineering of existing systems. "What we want is interactive, graphic, vivid, clear, easy to use terminal interfaces. Then the chief executive and everyone else will be able to take advantage of computing power," Nelson commented.

One of the youngest exhibitors was 14-year-old Andrew Shonman, of New York, who had used his TRS-80 to develop a system which calculates and displays positions of the stars and moon.

To enthusiastic applause, he commented, "We do not need better computer products but better computer art."

In the 92 exhibits in the crowded personal computer exhibition hall in the Sheraton Hotel and its associated handful of private presentations, mainly from schoolchildren, there was far more ingenuity of computing application than in the four floors and over 400 exhibitors whose slick sales staff and booths provided the main focus for the visitors who swarmed through New York.



Control Dataset invest in new premises to serve you even better.

Control Dataset have moved to extensive new premises at Stevenage, Hertfordshire.

So Britain's leading computer supplies company now have expert sales and service departments, spacious warehousing and efficient despatch facilities, all at one location.

This major investment reflects Control Dataset's dual commitment to their customers: to provide the highest quality products, backed by the most dependable service.



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Control Dataset Ltd, Angle Way, Stevenage, Herts SG1 2JL Tel: 0438 632044 Fax: 0438 632045

Bright ideas come to life

WALKING around the personal computer exhibition at the NCC, one would not be surprised to come across a scrawled sign stating "Micro-controlled fire-bomb kit and rocket launcher. Charlie Brown Jr. 12".

At this year's exhibition there were two distinct personal computing sections: the stands showing the emerging array of personal computing equipment from purely commercial suppliers; and then, intermingled with these as well as in a special competition section, the presentations of individuals whose bright ideas had taken on form.

One of the most startling stands was set up by Amstrad, the Radio Amateur Satellite Corp, which is about to launch the world's first personal computer "switchboard" into space.

Then there was Nickey Naumovich Jr, president of Parsec Inc, a science-oriented, Dallas-based corporation engaged in the study and practice of energy conservation. In display he had his linear 8080 microcomputer exhibit showing how to calculate energy losses in a house and also a new house insulation material which Parsec is now marketing under the name of Thermie-Brite. This is claimed to cut out the major cause of heat losses as identified by his program—cracks in the wall.

In addition to being president of Parsec, Naumovich is also a high school student in Dallas, and two years ago, at the age of 15, he was exhibiting his first micro development, a system to identify the times and places of the eclipses of the sun.

Elsewhere, artificial intelligence was well in evidence with Heath and Terrapin. Both stand about three feet high and move along like a Meccano Dalek. When it bumps into an object it reverses and wheels away. It is the invention of 16-year-old Holden Coome of New York.

Terrapin is a development of the Logo turtle artificial intelligence research work at the Massachusetts Institute of Technology and Edinburgh University.

The Logo Turtle project was concerned with the way in which a mobile "robot" could be used in teaching situations. An undergraduate at MIT thought this could be an interesting device for personal computer enthusiasts and hit upon the idea of writing programs for it. This led to the creation of the Logo turtle.

The result is Terrapin, marketed by Terrapin Inc in Boston, selling at \$1000 for an assembled Turtlenecks \$400 for a kit which can be interfaced with most home computers.

One of the youngest exhibitors was 14-year-old Andrew Shonman, of New York, who had used his TRS-80 to develop a system which calculates and displays positions of the stars and moon.

To enthusiastic applause, he commented, "We do not need better computer products but better computer art."

In the 92 exhibits in the crowded personal computer exhibition hall in the Sheraton Hotel and its associated handful of private presentations, mainly from schoolchildren, there was far more ingenuity of computing application than in the four floors and over 400 exhibitors whose slick sales staff and booths provided the main focus for the visitors who swarmed through New York.

"Advertisers Announcement"

DATA SYSTEMS NEWS

A new market leader

The new Perkin-Elmer Model 3220 second generation Supermini, launched here last month, is already establishing itself as the most successful product in the history of Perkin-Elmer's Computer Systems Division.

Since its USA release at the end of February, orders worth in excess of \$3.5 million, representing some 40 machines, have been booked.

Judging by the enthusiastic reaction of visitors to the US National Computing Conference in New York earlier this month, where the Model 3220 had its first public showing, this rate of orders is certain to accelerate rapidly in the near future.

PRICE BREAKTHROUGH The new Model 3220 offers a truly optional combination of computing power, reliability, upward compatibility and mature software at price levels hitherto associated with very much less sophisticated products, ranging from £23,115 for the simplest configuration with 256K of memory to £40,715 with 1M of memory.

This must be regarded as a major opportunity to obtain the benefits of 32-bit computing power by many end-users, OEMs and system houses concerned with interactive and real-time applications in the business, scientific, automation and data communications fields.

FIELD-PROVEN SOFTWARE There is an extensive list of field-proven Perkin-Elmer 32-bit software products all available for use on the Model 3220. This includes the OS/32 real-time, multitasking operating system, ITAM transaction controller, ITAM for data communications, superfast FORTRAN VII, COBOL, BASIC and many more. This represents a massive 500 man-years of 32-bit software development, quite without parallel in the minicomputer industry which has, in general, only just started to grasp the significance of 32-bit architecture.

UNIQUE EXPERIENCE Perkin-Elmer introduced the world's first 12-bit Superminis as long ago as 1973 and produced the first microprogrammable mini, the first mini to directly address 16K of memory and the first mini with writable control store. There are now some 2500 Perkin-Elmer supermini systems installed around the world. This wealth of experience, obtained and consolidated where it really matters, in the field, offers the prospective user a level of solid assurance which is quite simply, unobtainable elsewhere.

REDUCED LOSSES An important feature of the system is its ability to place stops on lending where, for example, a student nears the date of his leaving the Polytechnic or has persistently failed to return books on time over a period.

The study also led to the change-over to automated catalogues on microfiche for the library of some 100,000 books and other reference media.

COMPETITIVE Major benefits claimed for the system are, firstly, a truly dramatic reduction in project duration, from design to commissioning, and, secondly, the possibility of analysing designs more thoroughly and in different ways.

Both these benefits represent substantial competitive advantages to Wakefield and Imberg, whose highly specialised expertise is now repeatedly sought by many of industry's most illustrious names.

AUTOMATION

Specialising in the design and construction management of civil and mechanical engineering equipment, Wakefield and Imberg, whose Managing Director is a passionate believer in "small is beautiful", are determined to automate everything that can avoid increasing administrative staff and the kind of problems

which would turn him into an administrator.

MULTIPLE USES The computer system is based on a Perkin-Elmer Model 8/16 mini-computer coupled to a graphics display terminal, a 30-inch drum type automatic drafting machine and a printer. The computer has 64KB of memory, 10Mb of disc and is programmed in FORTRAN.

Primarily intended for the development of structural analysis, equipment design, automated drafting and customer quotations, the system will also be used for project accounting and invoicing.

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ISSUE NO 6

Multi-user system for £20 K

Users of time sharing utilities and those who normally queue for access to a minicomputer, should look into new software releases from Perkin-Elmer.

A very low cost multi-user system can be acquired following the announcement of enhanced software for the Series 3200 computers.

Based on the OS/32 Operating System, features include sign on, password and account numbers, command language, editing software for interactive program development, scheduled jobs mode for background batch processing and output spooling facility for later printing.

Memory partitions are allocated at run time according to the number of users, the facilities required and the total amount of storage.

Compilers available include FORTRAN IV (Extended) and COBOL. Also available is BASIC in the form of a run time interpreter and CAL, Perkin-Elmer's Assembler with an optional MACRO version.

Price for a typical hardware system is just over £20,000, a matrix printer, 10Mb disc and a floppy disk drive interface and one terminal.

Personal number cruncher

3200Team under starters orders

Out in front with the 3200 Team is the theme at the Perkin-Elmer International Sales Conference at the Skylene Hotel, Heathrow, last month, at which the main event was the launch of the new Series 3200 range of Superminis.

Attended by company personnel and distributors from all over Europe, the Middle East and Africa, as well as the UK, USA, Canada and Japan, the Conference established and briefed teams of professionals to sell and support the 3200 Series, which has already made a major impact in the USA since its release there in February.

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REDUCED LOSSES An important feature of the system is its ability to place stops on lending where, for example, a student nears the date of his leaving the Polytechnic or has persistently failed to return books on time over a period.

This feature is expected to reduce considerably the level of book losses to the library.

MAJOR BENEFITS The real-time system comprises the Perkin-Elmer Model 6/16 with 64K of memory, 10Mb of disc and a tape drive. There are seven teletypes to read the bar codes on books and on borrowers' tickets, and two operator VDUs.

When fully operational, the system will confer major benefits, not only in respect of reduced book losses but also by making possible a much better service to borrowers; simplifying many administrative tasks and providing much useful statistical and other information required by the growing library.

TRANSACTION PROCESSING The application is, in fact, shared between two computers. Real-time transaction processing, enquiries and controls are managed by the Model 6/16, whilst follow-on batch processing is handled by an existing 8670 mainframe on the basis of a magnetic tape journal of each day's transactions.

The heart of the real-time system is the Loans file and the directly associated Index file, the purpose of which is to provide a cross-referencing facility to the loan record in the Loans file.

For further information contact: Jane Berry, Slough (0753) 34511 • Tim Marlow, Manchester (061) 928 8711

NCC IN NEW YORK

Computing power in the home

In a whirlwind tour of the 1980s, Charles Lechi, founder and head of Advanced Computer Techniques Corp., gave the audience at one of the NCC '79 plenary sessions some glimpses of his view of the future of computing and the communications market.

A profusion of intergalactic slides illustrated his talk, which focused on the coming battle between IBM and AT&T for the computer-communications market of tomorrow. He likened cities to silicon chips, and the AT&T proposed Advanced Communications System to a giant computer in itself.

He saw computing power being delivered to the home and the office just like gas and electricity with AT&T and Satellite Business Systems becoming new utility companies.

Although he foresaw computers taking over an enormous number of jobs now done by people, his overall thesis was hopeful.



Muscling in on the athletes

AMERICA's athletes at the 1980 Olympics will get the benefit of a new computer system, developed by former Israeli Olympian athlete Dr Odeon Arish, now a vice-president with Biomedical Analysis Corp of Amherst, Massachusetts. The system runs on a Data General Eclipse 8/260 minicomputer and the company has presented the US Olympic committee with a configuration worth \$200,000. Al Darter, four times Olympic discus champion between 1956 and

Asked if the system would be made available to other countries, Data General co-founder Herb Richmire said, "We are an equal opportunities company."



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NCR

Reports by Tim Palmer and Chris Hipwell

Huge opportunities for new companies

If anyone could still have any doubts about the dynamic nature of the US computer business after seeing the NCC exhibition, those doubts would have been dispelled by a panel session on Business and Entrepreneurial Opportunities in Computers.

Untold opportunities for starting up new companies exist in the computer field, according to William Gannon of Systems House and Minicomputer OEM Directory, one of the panellists.

Looking specifically at the systems house phenomenon in which companies purchase equipment from a variety of suppliers, add value to it in the form of interfaces, controllers and software, and re-sell it, Gannon said that there are now 2,000 such companies in the US and that they are increasing at the rate of about 200 new companies a year.

Gannon sees lack of skilled personnel as the main reason for the increase in systems houses. Where both hardware manufacturers and potential users are experiencing a shortage of engineering and technical staff, opportunities exist for such people to start up in business on their own account.

And, says Gannon, this trend has been fostered by the larger minicomputer manufacturers such as DEC and Data General which are interested primarily in shipping hardware incorporating hot hardware into custom-built systems. In addition, the early 1980s millions of small computers will be sold, according to Isaacson, and this will open up markets for people with hardware, software, educational and servicing skills. In particular, people will be needed to customise software and this could lead to the emergence of a new profession, "certified public programmer".

Database machine is still some way off

THE concept of the database machine — a back-end processor which off-loads all the data base management functions from the mainframe — is increasingly talked about, but judging from the session at the NCC, it is still some way off.

The attractions are clear. A Univac research project did a simulation of a back-end data base running DMS-1100 on a 1108 found that the CPU load on the host was reduced by between 40 and 50%.

The most celebrated back end database processor developed so far is the one from Cullinane under US government contract. Dr Robert Cullinane, a Cullinane vice-president, described the system developed, which runs Cullinane's IDMS on a DEC PDP-11/70 back-ending an IBM 370/158.

The 158 ran under SVS and the 11/70 under IAS, and the implementation required two major pieces of software on the mainframe and two on the back-end. On the mainframe, a host network resource controller

was needed to handle our sign-ons and communications, and an inter-computer communications system which embraced message transfer, packet transfer, a protocol and line driver. This was mirrored on the PDP-11, which also required a back-end resource controller. In addition, the full IDMS data base management system was implemented on the PDP-11.

In order that it would be transparent to both host and back-end whether a request came from the minil or the mainframe, and also to make the mainframe programs treat the database as if it were local, a "Twin Task" program on the host was installed for each application program using the database. Communication with the host was implemented with IBM 3270 emulation. The mainframe was installed in Kansas, and the minil in Georgia, and since it was delivered, the US Navy has implemented a dual host system where a Control Data mainframe can access the database as well as the 370.

In the meantime, the 32-bit microprocessor was forecast for 1982 and by 1985 a chip with full functionality, including perhaps 128Kbytes of memory, of a present-day 32-bit mini will appear.

In the meantime, the 32-bit microprocessor was forecast for 1982 and by 1985 a chip with full functionality, including perhaps 128Kbytes of memory, of a present-day 32-bit mini will appear.

By that time, classical forms of minicomputers, minis and so forth will have been made obsolete by the march of technology.

Dr Herb Holloman, of AMDahl, was equally less apocalyptic, and his lengthy memorandum of 1985 did not look too different from those of 1980. There were, of course, some significant differences, in that he predicted that the 32-bit microprocessors would



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COC 9386 600LPM Line Printer with POP11 interface £5,100 + VAT

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POP 11/34 A-WO, 5½-inch box, 240-volt, 64 kw.
Fungus MOS Memory £7,209 + VAT

POP 11 Y80-CB with 64kw Fungus MOS Memory £17,350 + VAT

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MORE NEWS FROM THE NCC

With over 4,000 booths and nearly as many companies vying for attention, the NCC presented the biggest concentration of computer equipment on show in the US this year... Here TIM PALMER and CHRIS HIPWELL report on more of the products on offer.

800 is twice as good says Harris

NEW from Harris at the NCC was the Series 800, featuring two models, the 850 and the 870.

The 800 offers between 1.8 and 2 times better performance than the S/500, introduced at the 1978 NCC, and this is achieved by use of a pipeline processor which can be prefetching and executing up to seven instructions simultaneously.

Not a true 48-bit processor, it nevertheless has a 48-bit data path throughout the machine; the register size is the standard 24 bits used on all Harris machines. It runs the same Vulcan operating system used throughout the Harris series, but features additional instructions over the S/100 line.

The 850 costs from \$280,000 to \$300,000, compared with

\$180,000 to \$200,000. Harris installed about twenty-five 500s in the first year of marketing.

Harris also showed its new 1670 communications system, which is built around an emulation of the Interdata mini Harris formerly used in the 1600 series, which is manufactured in-house.

Key features of the 1670 are concurrent RJE, local batch, data entry, local interactive, and 3270 or Uniscope interactive processing with IBM or Univac hosts. Up to 16 IBM 3270 interactive terminals can run concurrently with up to 16 keyterminals, and Harris has completely rewritten the operating system for the new processor.

General Automation launched the SAFES Swift and

Foreign Exchange System package, developed in Europe, at the show, and got strong response from bankers.

Computer Automation has redesigned its Naked Mini 4/10 board computer so that it fits into a small, compact box for process control applications.

The new version, which like the 4/10 is built around a 16-bit Computer Automation-designed LSI chip set, is called the 4/04. The 4/04 is offered at under \$1,000 with 16K words of memory.

• Underlining once again the free-for-all opened up in the minicomputer market by the bit-slice microprocessor, Ampex has been offering its own minicomputer for 12 months now.

The Kennedy Series 7000 was one of several Winchester-type fixed discs on display. This model can store up to 12 Mbytes.

Productivity boost claimed by Prime for Cobol generator

A COBOL program generator claimed to give a dramatic boost to productivity was demonstrated at the Prime stand by David Black and Associates of Pittsburgh.

Designed for use with any machine for which an interactive ANSI 74 Cobol development system is available, it is already being widely marketed by Prime. Data General is showing keen interest in adopting it version; and it is also running on DEC and Univac machines.

One claim for it is that a bill of materials processor consisting of 20,000 lines of Cobol was developed, debugged and tested in 10 days.

It is designed to produce efficient Cobol code through a question and answer sequence, and maintains a data dictionary of all files and their contents. It supports data entry, reporting and utilities, and is claimed to offer considerable aids to debugging and testing.

It is licensed for the particular machine the user intends to run it on, marketed in the UK through Prime International, and costs \$25,000. Maintenance is \$2,000 a year, with two new releases annually.

Multi-host options on Paradyne's Pix II

MAJOR software extensions have been added to Paradyne's Pix II communications processor, enabling users to build multi-host networks around IBM mainframes; access different applications and software subsystems on the miniflame from a single terminal, all without touching or adding to the software on the IBM 370 or 308X host.

The enhanced version of Pix II is called Pixnet, and runs on the same standard processor already used by Paradyne in the local and remote control unit in a Pix II network.

Pixnet adds a key element to the standard Pix II repertoire of controllers, a network control unit. All three processors use the same hardware, a Paradyne emulation of the General Automation 16/220 microcomputer with some altered and some additional instructions.

The network control unit performs the functions of directing terminal messages to the right application on the miniflame, and of line concentration. A local control unit is still required at each miniflame, and at least one remote control unit at each terminal site.

The network is initialised in the network control unit. On the miniflame, the required number of device addresses are made available to system programs like CICS and TSO under which applications to be remotely accessed are running. Requests

for these applications from the terminal sites are then directed to the host via the NCU, and the host accepts the messages as if they came from a local peripheral.

The network control unit nodes also handle routing of messages through the network, and data is carried in packets similar to IBM's SDLC frame.

The network control unit will never succeed without thorough systems analysis and tight control. If you simply split the work in two and give some to conventional typists and the rest to WP, it makes as much sense as dividing your garden down the middle, tending one half with a spade and the rest with a bulldozer.

When you've done all that, talk to a supplier. Get into the machine and compare its facilities with your requirements. Do the facilities suggest better ways of designing your system?

When you've designed the system to make best use of the new technology, write it up. Yes, old bore documentation is essential. You are dealing with a computer.

Make sure authors and typists are fully trained and have adequate documentation, but be ready for amendments. A flexible system is essential to allow for the erratic demand for typing services. Remember a typist knows about typing — once she understands the machine her suggestions will be valuable.

but that won't automatically make him a good writer. Author training is the first essential of successful WP.

"Expensive machines were sitting unused in the corner of some offices... because there was not enough room for improvement in the areas of work they had been brought in to tackle."

"Some departments such as Social Security and the Army did, however, have good control procedures for WP."

Let's forget about electronic mail for the present. Word processing now is about the computerised typewriter. If you emphasise "typewriter" you could persuade your purchasing manager to spend seven or eight thousand on a fancy machine just to try it. Stick it in the typing pool and let them play around with it. But don't go crying to the supplier if you don't get the benefits you expected. A typist knows about typing. She doesn't know about control procedures, systems analysis, or unintended side effects.

If you emphasise "computerised" you will realise that you need to ask, "What is the effect of introducing computer disciplines into the less organised areas of the office?" When you try to answer that question, you will realise that word processing will never succeed without thorough systems analysis and tight control. If you simply split the work in two and give some to conventional typists and the rest to WP, it makes as much sense as dividing your garden down the middle, tending one half with a spade and the rest with a bulldozer.

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understands the machine her

suggestions will be valuable.

LETTERS TO THE EDITOR

Implications of word processing

No joke at all for some

FURTHER to George Penney's letter headed, Why programmers are in short supply (Letters, May 24), colleges have for many years run courses for computer programmers. At my own college we run a full-time course based on the CGI 747 (Computer Programming and Information Processing). This is a nine-month course (one academic year) and covers the educational requirement of the certificate, but allows us to improve the students' general education and provide some basic training.

The staff feel we make a valuable contribution to the practical commercial field of programming and regret that this certificate is not more widely recognised.

The BEC/TEC committee has published details of its National Awards in Computer Studies and these are designed to enable the not too "academic" to embark upon a career in business programming.

If employers or students are interested in courses, they should contact their local college, who will be pleased to send them details.

DIANA HOSSACK
South Thames College,
London.

An under-used qualification

folder of written programs (albeit small, but nevertheless relevant) to enable employers to evaluate their potential. The less able (in this direction) secure employment as data control clerks, etc.

The staff feel we make a valuable contribution to the practical commercial field of programming and regret that this certificate is not more widely recognised.

The BEC/TEC committee has published details of its National Awards in Computer Studies and these are designed to enable the not too "academic" to embark upon a career in business programming.

Mainly our students are school leavers, many without academic qualifications (we have our own selection procedure). Students who display an aptitude for programming can develop their talents and have, on completion of the course, a

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FERRANTI
Computer Systems

Tripling of disc traffic

A SEMICONDUCTOR memory unit which emulates the IBM 3280/3830 and 2308/2808 disc subsystems has been introduced by Intel.

Called the FAST 3805, the new unit is totally transparent to the CPU and, because access times are extremely fast, it is claimed that the 3805 can triple disc traffic without adding new channel or controller capacity.

The new unit incorporates an Intel 8086 microprocessor which manages the IBM 370/308X channel protocol and emulates the interface between the 370/308X channel and the 2838/2308 or 3830/3350 controllers/disk systems.

The module also carries out double bit error correction and records the chip location of any errors.

Storage of the FAST 3805 ranges from 12 to 72 Mbytes and data can be transferred at speeds ranging from 15 to 44.2 Mbytes per second.



JACQUARD SYSTEMS

AM International subsidiary, Jacquard Systems, gave demonstration of its J100 small business system, which attracted considerable interest throughout the show.

COMPUTER WEEKLY

'Grandiose' EEC law project panned

From front page

controlled vocabulary retrieval or free-text retrieval; and general problems brought about by the fact that most systems were not designed for legal purposes and have only been adapted.

Lawyers have particular needs in retrieval, such as that they must be able to have complete confidence in the recall of the system — ie, that nothing has been missed in a search. Also being non-technical they are difficult to train. Civil servants, financial people and so on would also have to be able to use the system.

The study group's proposed design is for a system that would be completely portable between micros, and highly parameter-driven so that different options could be selected at different installations.

Criticism was also voiced of the user survey, on the grounds that it did not go into enough depth and dealt too much with academics rather than grassroots practising lawyers.

According to Killoury, the proposed system would only take about 40 man years to develop, whereas most of the existing ones took between 50 and 100 man years.

lating the operating instructions designed for them into those of the central system. Both free-text searching and controlled vocabularies could be used with the same software. This would be quite difficult to achieve.

While some of the lawyers at the symposium agreed with the group's proposals, others thought that such a big system would not be practical, or was unnecessary, or would not be worth the trouble of converting everything they are using at present. Conversion would be a particular problem, for the existing suppliers, several of whom thought that their own system should be adopted for Europe-wide use.

Those disagreeing felt that it would be better to "build on what we've got" rather than starting from scratch with a new design.

Criticism was also voiced of the user survey, on the grounds that it did not go into enough depth and dealt too much with academics rather than grassroots practising lawyers.

To the Exhibition Manager,

COMPEC'79

Room 821, Dorset House, Stamford Street, London, SE1 9LU.

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Ref: SW1/2108

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Ref: SE1/2108

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SYSTEMS GROUP

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Lend a man responsible for the development and support of the OEDROM 3 operating system on the ICL 19045. An experienced operator should have in-depth knowledge of ICL/URGOS 3 and be able to manage a team of programmers. If you have less experience you could be a member of the team. Current projects include the implementation at the North West University of Syntex (ANHES), the investigation of floating subsystems, and the assessment of new systems such as CYBER 72/CW. The salary will be on the scale £4,222-£3,145 p.a. or £8,858-£6,452 p.a. depending on experience. The scales will increase to £4,333-£3,145 p.a. and £7,227-£8,992 p.a. in October, 1979.

COMPILERS
Help to provide, maintain, and support a wide range of compilers. You should have experience of compilers and systems programming. Together with a knowledge of FORTRAN and one other language, you should also be familiar with the ICL 19045 systems and its interface. Salary: £1,100 p.a. plus £4,222-£3,145 p.a. The salary will be on the scale £3,669-£2,104 p.a. which will increase to £4,173-£2,104 p.a. in October, 1979.

RESOURCE CONTROL SYSTEMS
Assist in the provision of resources control as required. The successful candidate will be working with a team responsible for the development and support of software to monitor and control computer resources allocated to users. You should have experience of program development and implementation. Salary: £1,767-£1,781 p.a. The salary will be on the scale £1,820-£1,840 p.a. or £4,222-£3,145 p.a. depending on experience. These scales will increase to £3,755-£2,104 p.a. and £7,333-£7,821 p.a. in October, 1979.

INTERACTIVE SYSTEMS GROUP

COMMUNICATIONS SOFTWARE
Oracle software for public computers to the Post Office PBS via GE4070. You should have a successful record of implementing software systems and the ability to manage technical development. Experience of real-time systems would be an advantage. If you have less experience you could join the team at a lower grade. Ref. 127/78/CW.

The salary for the senior programmer will increase to £7,227-£8,992 p.a. in October, 1979. The salary for the junior programmer will be on the scale £3,689-£2,104 p.a. or £4,222-£3,145 p.a. depending on experience. These scales will increase to £3,776-£2,104 p.a. and £7,333-£7,821 p.a. in October, 1979.

INFORMATION AND DOCUMENTATION
Work with a team which produces manuals describing the computer services offered to our 10,000 users. Particular emphasis will be given to the production of documentation for the CYBER 72 interactive computer. This will involve the ability to take part in the advisory service provided to these users from the University of Manchester. The salary will be on the scale £3,669-£2,104 p.a. which will increase to £3,776-£2,104 p.a. in October, 1979.

INTERACTIVE SYSTEMS
Join a team which maintains contact with representatives of the various local authorities and their development and support of the services based on the CYBER 72 running on the IBM 360/370 computing system. Current project areas include system performance monitoring and analysis, liaison management, and planning interfaces. You should have some experience at systems programming, preferably on Control Data computers. Ref. 128/78/CW.

The salary for both posts will be on the scale £3,669-£2,104 p.a. or £4,222-£3,145 p.a. depending on experience. These scales will increase to £3,776-£2,104 p.a. and £7,333-£7,821 p.a. in October, 1979.

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Join a team which maintains contact with representatives of the various local authorities and their development and support of the services based on the CYBER 72 running on the IBM 360/370 computing system. Current project areas include system performance monitoring and analysis, liaison management, and planning interfaces. You should have some experience at systems programming, preferably on Control Data computers. Ref. 128/78/CW.

The salary for both posts will be on the scale £3,669-£2,104 p.a. or £4,222-£3,145 p.a. depending on experience. These scales will increase to £3,776-£2,104 p.a. and £7,333-£7,821 p.a. in October, 1979.

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REF: S2/1406

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JBA

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Contact: Mike Creamer

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Contact: Jim Baker

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Contact: Andy Wright

Programmers & Analysts

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Contact: Mike Creamer

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All successful candidates will receive full relocation expenses, including agents fees, an initial family separation allowance and a minimum of 6 weeks holiday per year (plus all statutory holidays). German lessons will be provided.

Contact: Andy Wright

For further information on any of the above vacancies, please contact the appropriate consultant.

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**Lloyd Chapman
Associates**

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Ref: TE9/8940/CW
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The Unilock Group of Companies, leading European supplier of relocatable partitioning systems, is currently expanding its computer operations and intends to appoint a D.P. Manager to be directly responsible to the Computer Services Manager. An ICL 2903 is already in operation and future planned developments include a major computer graphics installation. Applicants, in the age range 25/35, should have experience in systems analysis and design and preferably a knowledge of Fortran IV or RPG II. The successful candidate can look forward to total earnings in the region of £8,500 p.a., together with participation in pension and medical insurance scheme. If appropriate, relocation assistance will be provided.



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Ladbrooke Casinos are acknowledged as the leading company in what is a young, dynamic and very exciting industry. With four Casinos in London, soon to include the Ladbrooke Hyde Park Casino, probably the most luxurious in Europe, and eight in the provinces plus an ambitious expansion programme, the Company is reviewing its total data processing strategy. Based on powerful minis we are intent to start the design and implementation of a completely new on-line management information and control system.

Our hardware investment may well exceed six figures and equipment selection is now in hand.

Plans include Batch, Interactive, real time, communications and distributed processing, covering routine accounting such as payroll through to signature recognition, COM, marketing and financial modelling.

The Company offers a wide range of benefits from Lancashire Vouchers through to Holiday discounts.

If you have relevant experience to offer, preferably in a high level language and are prepared to make a significant contribution to our development effort right at the beginning of this exciting project, we can promise you a quick interview and genuine interest in your future career development.

Contact: Neil Lester,
Ladbrooke Casinos, 01-499 8321 day, 01-952 1421 evening.



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To manage and develop systems on an on-line mini-computer. Installation in South Wales

Salary offered c. £20,000.
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to £4,800
Our client requires a young RPG II programmer, preferably with some COBOL, and 2 years 2900 experience. Good prospects with permanent contract.

NORTH CHESHIRE SENIOR PROGRAMMERS
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Senior programmers with sound IBM or Honeywell experience are required by a leading UK consultancy. Must be self-motivated. Wide range of applications available.

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Analysts with up to 2 years financial or production control experience are sought by our client. Opportunity for progression and to see systems through.

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PROGRAMMERS** to c. £6,000
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ASSEMBLER BACK-GROUNDS Analysts are required with sound commercial experience. Salary and prospects excellent.

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COBOL programmers with 2 years + experience are required for development and maintenance of both batch and on-line applications. Go-ahead IBM installation.

MANCHESTER SYSTEMS ANALYST

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Our client operates a large IBM installation under OS/VS / CICS and is seeking Analysis with 2 or more years experience. Some programming experience preferred but not essential.

LIVERPOOL PROJECT LEADERS

to £8,000
Project leaders with an in-depth experience are required by our client. Major developments in a large and advanced installation.

LIVERPOOL SENIOR SYSTEMS ANALYST

to £7,000
Our client is seeking Senior Analysts with a wide commercial background. Excellent prospects and benefits with this major company.

WARRINGTON COBOL PROGRAMMER
£4,300
Our client requires a young COBOL programmer with over 9 months experience. Good benefits and guaranteed reviews.

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to £5,500
Young, well educated COBOL programmers with over 2 years experience on any hardware are required by our major client. Opportunity for development work on a number of applications.

LIVERPOOL PLI PROGRAMMER
to £4,500 + BENEFITS
Large, Liverpool based organisation requires young, bright, PL/I programmer to work on interactive financial applications with Database involvement. Excellent opportunity for staff with sound 2 years experience.

LIVERPOOL SYSTEMS ANALYSTS
to £8,250
Analysts with 3 years + experience on commercial systems are required by our client who is shortly to update to 2900 hardware. Good salaries and prospects.

LIVERPOOL PROJECT LEADERS
to £8,000
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LIVERPOOL SENIOR SYSTEMS ANALYST
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Phone STEVE SYKES on LEEDS 44186 (daytime) or on LEEDS 652417 (evenings or weekends), or write with brief details (no stamp required) to Lorien Computer Services, FREE POST, Leeds LS7 3YY.

"If you're considering a move then you should contact Lorien first"

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For further details concerning these appointments please contact Eddie Howard

COBOL 18 months +
HOME COUNTIES £ to 8,000
Our Client has been making headlines again with the successful launch of their new series 32 Bit Mini. As a leading computer manufacturer they are always seeking new talent and in this instance they require someone with good knowledge of a JCL or time sharing. It is important that candidates are self motivated and well presented as client contact is inevitable.

For further details please contact CW239.

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Take advantage of our position as one of the leading recruitment specialists in the field of scientific programming. Today, more than ever, there is a demand for highly skilled personnel with the ability to tackle wide ranging projects in the design and development of scientific computer systems. If you hold a degree in a scientific discipline or have relevant practical experience of real-time mini computer systems, using either ASSEMBLER, BASIC+, MACRO 11, CORAL or FORTRAN, then give us a ring quoting ref. CW240.

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NEW IBM 4300 Plus NEW IBM 370 Equals NEW OPPORTUNITIES IN SLOUGH Basic salaries from £6000-£9000

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Senior operators (non shift)*
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SOFTWARE DESIGNERS

Do you have two to three years' experience de-
signing systems with microprocessors or minicom-
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We currently have vacancies for two Software De-
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ment.

The Department is active in a variety of fields in-
cluding Research, Electronics, Computing and Pre-
cision Engineering, giving the successful applicants
the opportunity to display their skills solving a wide
variety of problems.

Applicants should have a suitable degree or other
equivalent qualification, and have worked with at
least two of the following systems: PDP11/LSI11,
RT11, RSX11, IAS, M6800, Z80/8080. An
understanding of computer hardware would be a
distinct advantage.

The Department is currently based in London EC1
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The appointments would be financially attractive to
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telephone number where you can be contacted.

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Science and Technology

UMIST

CHAIR IN SOFTWARE ENGINEERING OR IN APPLIED MICROELECTRONICS

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position of UMIST in the application of computers and
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Applicants should have made significant contributions in areas
such as:

- The Application of microprocessors in Electronic Engineering or Data Processing
- System Development Environment
- Computer Assisted Design in Testing of Digital Systems in Microelectronics Components
- Distributed Computing
- Programming Languages
- Interactive Machines
- Design
- System Reliability
- Robotics
- Computer Theory
- Data Networks

Both Departments have extensive facilities to support
research and teaching of established B.Sc. and M.Sc.
courses and are jointly developing a new M.Sc. course
"Microprocessor Engineering & Digital Electronics". The
Microprocessor Engineering Unit within the Department of
Electrical Engineering and Electronics houses several
microprocessor development systems and other support
facilities including the CYBA-M multi-microprocessor
system. The Department of Computation contains several
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MicroAdm and MicroCobol and the development
environment for CYBA-M, plus a teaching laboratory based
upon six separate PDP 11/03 systems. Batch and
Interactive Computing Facilities are provided on the
1906A/7600 and CYBER 72 systems of UMCC. In
addition there is the DDC-11/10 system connected to the
SNC ICF network.

Each department has links to the UMIST Microelectronics
Applications Unit which has been established to provide a
mechanism for technology transfer to industry based upon
a consultancy service, prototype development and courses
for the re-training of industrial personnel.

Applications should be received as soon as possible after
the appearance of this advertisement. Salary will be in the
Professional range with a minimum of £11,000 from 1st
October, 1979, with a further rise of living increase to be
negotiated in October also from 1st October, 1979.
Further particulars and application forms may be
obtained from the Registrar, UMIST, P.O. Box 88,
Manchester M60 1QD, by quoting reference
EEE/108/BC. Enquiries may be made to the
Registrar, or to Professor D. Aspinall in the
Department of Computation or Professor H. C. A.
Hankins in the Department of Electrical Engineering
and Electronics.

THE COMPANY

ITT the International Telephone and Telegraph corporation was
founded in 1920 and is now one of the world's largest businesses. ITT
is a diversified, multi-product company with manufacturing and/or
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To maintain its current leadership in many areas of
telecommunications, electronics, and other fields ITT needs
specialised units with the capability to meet the rapidly changing
demands of the telecommunications market thus IDEC — The
International Data Engineering Centre.

THE LOCATION

These appointments are based in modern offices at Potters Bar which
is in the middle of delightful Hertfordshire countryside. It is easily
commutable from London and surrounding areas.

THE VACANCIES

IDEc are looking for people to join their expanding team of
professional programmers, which is currently developing software
aids for testing multiprocessor systems using the INTEL 8080, 8085
and the new 8086 microprocessors. The software is then simulated on
an IBM 370/158.

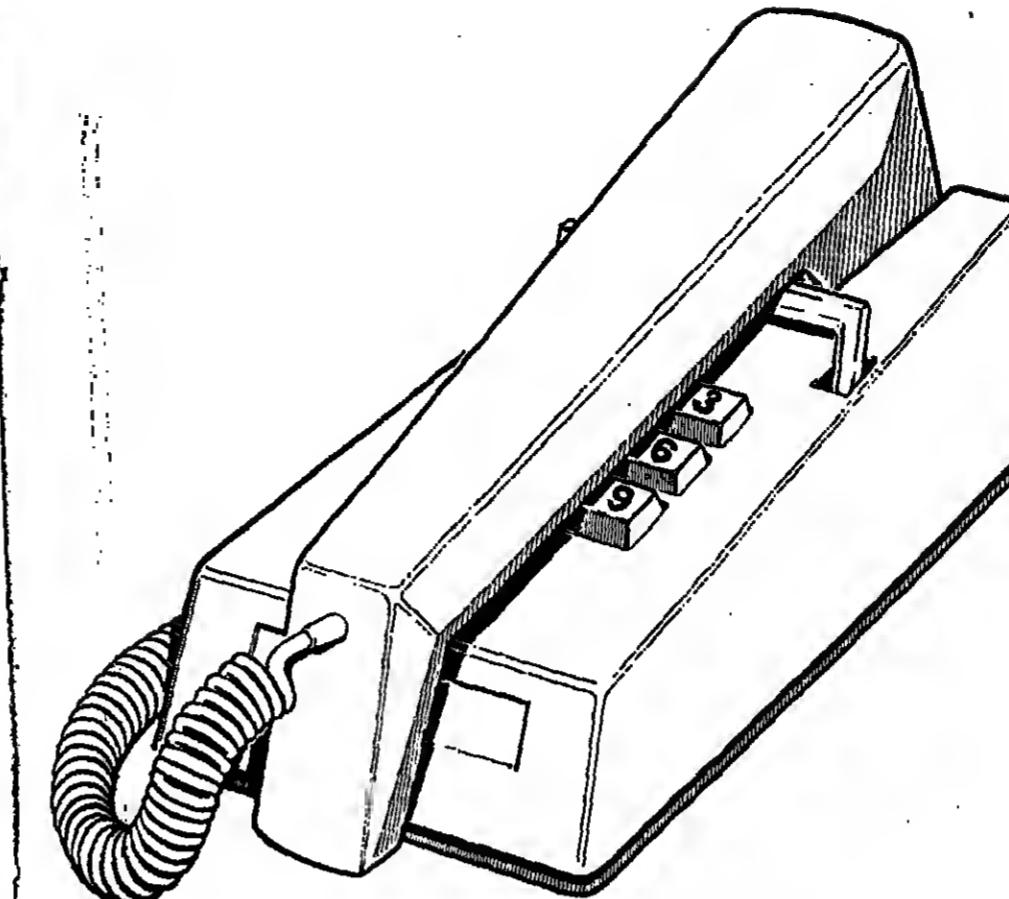
THE REQUIREMENTS

They would like to talk to you, if you have two years programming
experience gained in a mini or micro environment, and are interested
in developing future technology. As the Software is developed on an
IBM machine, your knowledge of any high level language coupled
with the desire to move into the technical field could be of interest.
This experience need not necessarily have been gained in an IBM
installation, although it would be useful.

THE FUTURE

Horizons are only limited by imagination. ITT has a record of past
innovation and achievement; present investment in research and
development will help fashion the shape of things to come.

IDEc 
A Development Centre for
ITT Business Systems



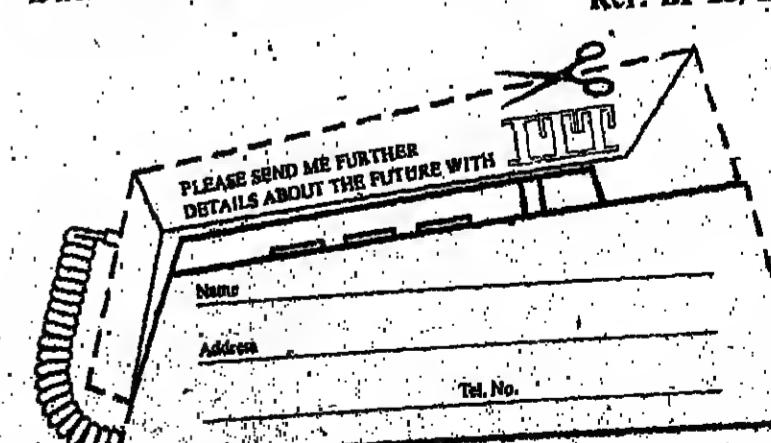
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is not convenient why not cut out the phone and post it.

Ref: BP 25/1



?	
<p>Our client, part of an International Pharmaceutical Group, is engaged in the research, development, manufacturing and marketing of a wide range of ethical and allied products.</p> <p>The delivery of an IBM 4341 is fixed for October next year to replace their existing IBM 370/125. Major developments are underway currently in production planning and control systems utilising DL1 and CICS. A committed programme of development will commence early next year with fully integrated DB/DC facilities. Their current EDP team of 37 staff is planned to expand accordingly. They currently require programmers or analyst programmers with good COBOL programming experience. Machine experience is unimportant. Training will be given in IBM assembler and CICS/DL1.</p> <p>This is a super company, offering free luncheons (comparable to most Wall End restaurants) and mid-morning snacks, an excellent 6 months sick pay scheme together with long term incapacity benefits. Free ALPA and personnel accident schemes with a contributory pension scheme. Salary negotiable up to £6,500 with a review before the end of the year.</p> <p>There is plenty of parking space and the Company is 5-10 mins walk from Piccadilly and Central Line Stations.</p> <p>24000 - £7000+ North-Midlands Analysts & Programmers 061-332 1184 (Please return if necessary) Sanderson Staff</p>	
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Technical Consultant (Circa £9,000+company car)

We are Tesco Management Services Limited, a newly formed Computer Services company, a wholly owned subsidiary of Tesco Stores Limited.

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We are looking for a high degree of professionalism plus good communicative skills, and a maturity that comes of experience rather than age. You will have demonstrated that you can cope in a variety of different environments and must have an awareness of the skills required to manage and motivate people.

You must be ambitious, and be prepared to work as part of a small but highly

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There is likely to be considerable U.K. travel and therefore you will need a current driving licence.

Benefits will include a contributory pension scheme, subsidised restaurant, and re-location expenses where applicable. For more information and an application form, contact: Fred Rayner, Tesco Management Services Ltd., New Tesco House, Delamere Road, Cheshunt, Herts, EN8 9BL. Telephone: Waltham Cross 32222 Ext. 3598.

Tesco Management Services Ltd.
Computer Consultants

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Join Data General's new Software Applications Group

Data General is already firmly established as one of the world's foremost computer companies. Now, as part of our continuing programme to broaden the service to our clients, we are setting up a new Software Applications Group to be based at Hounslow.

We need two experienced programmers and one systems analyst, who will provide the springboard for the further development of the new group... so career prospects will be excellent. Ideally you should have telecommunication or commercial experience on minis, preferably in COBAL or Assembler.

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You will receive a salary around £8-9,000 (depending on your experience) plus a company car. Demonstrated ability and personal growth could lead to a Project Leader's position in one to two years.

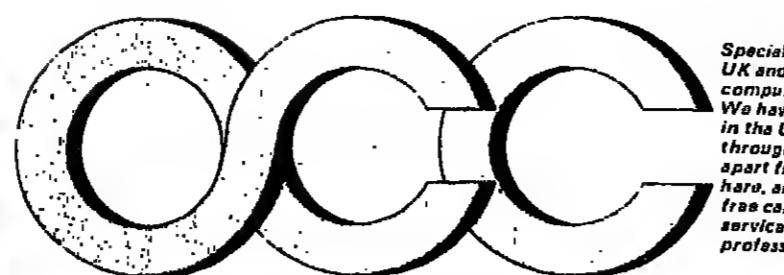
Programmers

You will receive a salary around £6-7,000. Unusually good opportunities for promotion to Systems Analyst are available within the Data General organisation. This is an excellent 'ground floor' situation with potential for advancement in the next year or two.

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Data General

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So if you are a graduate with two years' programming

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AEC Microprocessor Division

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Ring David Astbury for further details on 01-261 8016.

ab improve your career!

Our career planning advice HAS to be right — it comes from our top applicants and the people who hire them! It also comes from the people who we can't help — the ones that got it wrong. When we pick our jobs, we look for the training, the exposure, the rewards and the options that YOU are going to need as your career progresses. The following jobs are all 'CAREER BUILDERS.'

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For keen young professionals who have made a start in commercial programming or systems, this is one of the finest apprenticeships in the industry.

Ref. CA 765

SYSTEMS CONSULTANT

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Ref. CA 710

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Ref. EK 2175

SMALL IBM SYSTEMS

Kingston £4 1/2 - £8k + car + bonus
A successful systems house with a queue of new customers is eager to meet you if you have RPG 2 or BASIC with commercial applications experience. Bonus scheme, generous expenses, salary review twice yearly. From programmer to Project Leader you will enjoy working with this lively young team. Right by the station, own car perk + local pub with the best food in Kingston. Phone us quickly for this one!

If you have two years' good experience, on small machines, they are willing to teach you RPG2.

Ref. CC307

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If you need:
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The Company

A consultancy whose totally professional approach has earned them one of the highest reputations in the computer services industry.

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Contact Faye Ogilvie
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Person

A gregarious personality with a good current knowledge of the computer industry, organisation structures and applications, plus a background in systems, programming, consultancy or management.

Position

Reporting to the Marketing Manager, you will be responsible for account sales, developing existing clients and further expanding the already broad base of business. This involves travel to client sites so mobility is essential.

Jeffrey L. T. S.

£10K+Appointments £10K+Appointments £10K+Appointments £10K+Appointments

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MANUFACTURING

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TOTAL CIRCA £14,000
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BASED S.W. LONDON
WORLD-WIDE TRAVEL

Four outstanding persons are required to form a new department within a leading, multi-national organisation based in S.W. London. Operating as an integral unit, the persons appointed will be responsible for implementing a five year strategic and operational plan for the development and expansion of major computing facilities in the four business areas specified above. Each Consultant will specialise in one of these areas to establish and advise marketing/sales teams throughout the world, ensuring efficient policies are being pursued. They will possess a comprehensive knowledge of potential applications areas in order to identify and exploit future markets to which modern computer technology can most effectively be applied.

Candidates should offer

- ★ IN-DEPTH EXPERIENCE OF ONE BUSINESS AREA
- ★ ENTHUSIASM, CONFIDENCE AND Maturity
- ★ COMPUTER SYSTEMS BACKGROUND
- ★ THE ABILITY TO COMMUNICATE EFFECTIVELY WITH SENIOR MANAGEMENT

The Company is able to offer exciting career opportunities in a very rewarding environment, coupled with the security of a major U.K. organisation. Salaries are negotiable and will not be a problem for applicants with the required skills.

REF: S2/2106

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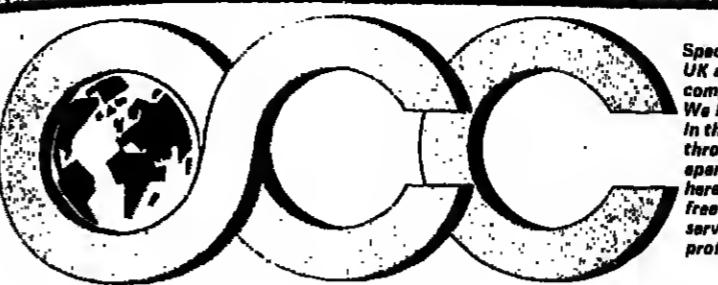
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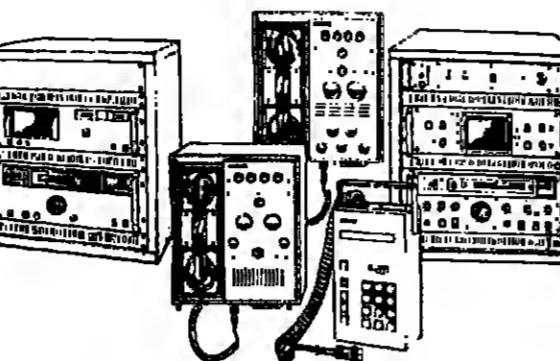
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You will have large systems operating experience in a data communications environment. You will ideally have experience of Burroughs equipment although this is not essential. More importantly you will be able to demonstrate that you possess management ability and organisational flair.

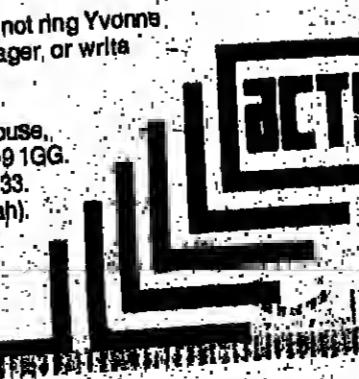
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Applicants, male or female, should telephone or write to Nigel Lugg, Personnel Department,

LIBERTY

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MIDLANDS APPOINTMENTS

Lively and progressive scene for all DPeople

By Mike Wood

THE Midlands offers a wealth of variety of industries, professions, trades and crafts. Perhaps by virtue of this it can rightly be described as the barometer of the nation's industrial climate. Scrutiny of the Midlands scene can easily bring to light the national trends in terms of development, requirements and problems.

The data processing sphere in this region continues to be a lively and progressive environment for most users, suppliers and support organisations concerned with computing.

Perhaps the people most enjoying the current situation are the more established, proficient and presentable members of DP staff themselves. Surely at no time in history can such a body of people have had so much choice of environment and possibilities for enhancement of incomes and skills, short of being a marriage broker during the reign of Henry VIII.

There are provisos, of course. Programmers need to have a good commercial language background. Analysts and analysts/programmers need to have had actual involvement in the design and/or implementation of financial systems. Skills in the technical areas of software programming or scientific applications tend to be as highly valued, but obviously by fewer organisations. Such is the demand for established but not untenable senior staff that it is not uncommon to see a programme increase his or her income by up to £2,000 in less than two years.

Indeed, one recent local study has shown an increase in starting salaries of 17% in the last three months compared with 15% for the previous six months. So the situation for the

operator staff still hovers

the age-old problem: half

the operators are frustrated

in their attempts to get to

grips with Cobol coding

skills and the like, while

applicants are obviously

looking to improving them-

selves. As has already been

stated, it is unlikely to be

purely financial, indeed,

with so many staff enjoying

fringe benefits, it takes a

great deal more than a

slightly increased salary to

prise people away from the

devil they know to an identi-

cal devil in a different

environment.

Illustrating this point is

the recruitment perfor-

mance of companies whose

hardware and/or applica-

tions developments lag be-

hind the general level.

Regardless of salary, their

inability to procure staff

becomes acute. As soon as

their development plans are

implemented, they once

again become an open

of interest.

Perhaps the area of great-

est influence is that of soft-

ware houses. Variety of

application, a high degree of

involvement and responsi-

bility, experience of dif-

ferent areas of equipment,

is what makes the software

house a success.

Despite the efforts I have

made by myself

commercial and industrial

organisations to procure

and retain staff, there exists

a disturbing vacuum of per-

sonnel in the middle range.

While accepting the prob-

lem that high level

languages and more sophis-

ticated operating systems

will eventually produce a

radical change to the ex-

isting scene, the problem

exists now and will become

more intense over the next

few years.

There appears to be only

one solution to this prob-

lem. Employers must be

afforded the resources to

take a greater induction of

trainees. The Midlands has

an abundance of institu-

tions producing a variety of

"qualified trainees".

The software house does

not suit everybody and

users are still able to retain

staff who are not attracted

by or are not suited to the

software house environ-

ment.

Computer science degree

holders are currently

favoured with employers

and have relatively little

problem in slotting into a

suitable position by virtue

of our environment.

There is no doubt that

the Midlands continues to

experience downswings in

the industry as a whole.

However, it may well

differ from other regions in

its ability to attract the less parochial

people from all parts of the country.

However, DP people

have a history of being very

loyal to their profession

rather than their employer.

It is easier for them to iden-

tify their career with a soft-

ware house which relies

solely on their effort rather

than as part of a cog in a

complex mechanism.

Despite the efforts I have

made by myself

commercial and industrial

organisations to procure

and retain staff, there exists

a disturbing vacuum of per-

sonnel in the middle range.

While accepting the prob-

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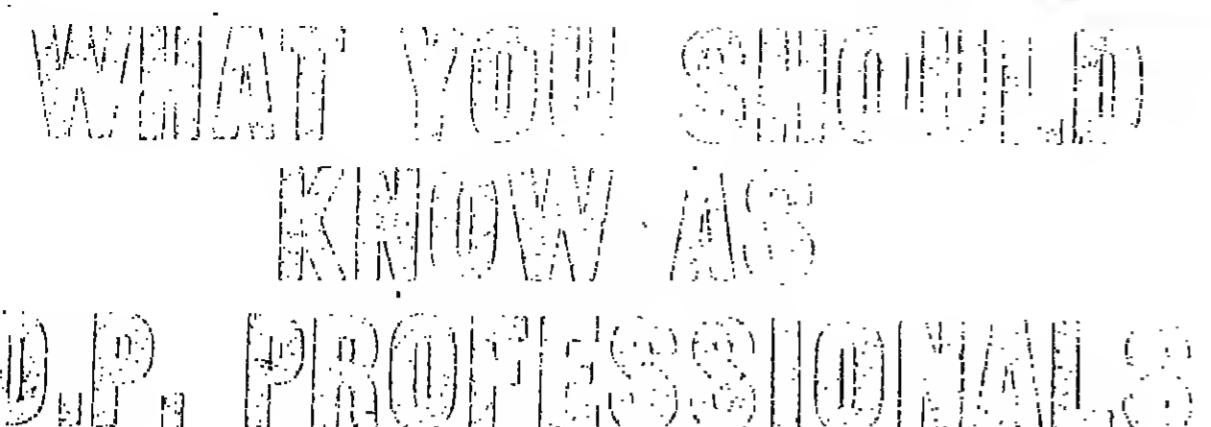
tions producing a variety of

"qualified trainees".

The software house does

not suit everybody and

users are still able to retain



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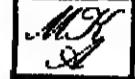
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MIDLANDS APPOINTMENTS

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The Groves, Crewe Arms, Salop
Tel: Crewe Arms 2711



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Application forms and further particulars may be obtained from the Staffing Officer, Derby Lonsdale College of Higher Education, Kedleston Road, Derby, DE3 1BS (Telephone Derby 47181) to whom completed forms should be returned by Monday, July 2, 1979.

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Applications for posts and further details and application form can be obtained from the Personnel Officer, Leicester Polytechnic, Priory Street, Coventry CV1 5FS, Tel: 0533 844991 ext. 101 to whom all completed applications must be returned no later than 8th July, 1979.

Applications for posts and further details and application form can be obtained from the Personnel Officer, Civic Centre, Millgate, Wigan, Tel: Wigan 44991 ext. 101 to whom all completed applications must be returned no later than 8th July, 1979.

PROGRAMMERS

NEI International Combustion Limited, is a major manufacturer of boiler plant, process plant and mechanical handling equipment for both the UK and overseas markets.

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Please telephone or write for an application form to P. L. Nice, Senior Personnel Officer, at the address below.

NEI International Combustion Ltd.,

Sinfin Lane, Derby, DE2 9GJ.

Telephone: 0332 23223.



HEREFORD AND WORCESTER COUNTY COUNCIL

HEREFORDSHIRE TECHNICAL COLLEGE

Applications are invited for the post of

Lecturer Grade II

In the Department of Science and Mathematics, duties to commence as soon as possible. Candidates must be suitably qualified to teach Computer Studies and Mathematics or Statistics. Experience in industrial/commercial application of computers would be an advantage.

Salary Scale: Lecturer Grade II £1101 to £1650 per annum (under review).

Further details and application forms can be obtained from the Principal (Ref. GEL), Herefordshire Technical College, Folly Lane, Hereford HR1 1LS, to whom completed application forms should be returned as soon as possible.

Application forms and further

particulars may be obtained from the Staffing Officer, Derby Lonsdale College of Higher Education, Kedleston Road, Derby, DE3 1BS (Telephone Derby 47181) to whom completed forms should be returned by Monday, July 2, 1979.

Salary Scale: Full-time £4246-£4832, inclusive of supplement); Part-time £2.20 per hour (inclusive of supplement).

Further details and application forms can be obtained from the Principal (Ref. GEL), Herefordshire Technical College, Folly Lane, Hereford HR1 1LS, to whom completed application forms should be returned as soon as possible.

Application forms and further

particulars may be obtained from the Staffing Officer, Derby Lonsdale College of Higher Education, Kedleston Road, Derby, DE3 1BS (Telephone Derby 47181) to whom completed forms should be returned by Monday, July 2, 1979.

The current configuration is a 48K 1901T with tapes and discs.

Northampton and the surrounding environment is a pleasant area in which to reside. Housing is reasonably priced and financial assistance will be given with relocation expenses.

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Mr. DAVIES

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This job will involve setting up, programming and Data Processing to HNC and Degree level.

The person should have recent practical experience in Computing and/or a degree in Computer Science. Previous teaching experience would be considered advantage.

For application form and job specification please apply in writing enclosing a large stamped and addressed envelope to the Personnel Officer, Civic Centre, Millgate, Wigan, Tel: Wigan 44991 ext. 101 to whom all completed applications must be returned no later than 8th July, 1979.

Applications for posts and further

details and application form can be obtained from the Personnel Officer, Civic Centre, Millgate, Wigan, Tel: Wigan 44991 ext. 101 to whom all completed applications must be returned no later than 8th July, 1979.

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If you are thinking of doing contract work why not start here by registering now for immediate and forthcoming requirements.

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Contracts to commence mid-August in South London. Must have Univac 1100 experience.

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RENDECK LTD. 100 New Bond St.
London W1. Tel: 01-629 5438

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An experienced ICL programmer with a minimum of three years' COBOL plus experience of JCL and Macro, EXEC 1+ knowledge an advantage. Immediate start.

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An experienced FORTRAN programmer required with knowledge of financial applications. Six-month contract in Surrey starting end July.

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HP 3000 Programmer

Required to start mid-July in Maidenhead an HP 3000 programmer with ASSEMBLER/OS experience. A knowledge of ICL useful.

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ICL 1900 Programmers

For contracts commencing July we urgently require ICL 1900 COBOL/GEORGE III programmers with financial applications experience.

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ASSEMBLER Programmers

IBM 370 ASSEMBLER programmers with VSAM experience, for three-month contracts in Croydon, to start mid-July.

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London W1. Tel: 01-629 5438

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We require PL/1 DOS/VS programmers, knowledge of IDMS an advantage. Six-month contracts in Kent. Start 2nd July.

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To work in Central London. Must have COBOL background.

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Experienced IMS COBOL programmers required for minimum of one year.

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London W1. Tel: 01-629 5438

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MVS Systems Programmer

We urgently require a very experienced systems programmer with in-depth MVS knowledge. Long contract. Immediate start. Essex.

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Six-month contract, Berkshire, for an experienced System 10 analyst with BASIC experience. To start immediately.

For further details contact:

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To manage and play a technical role in the preparation of specifications and plans, including administration, for hardware development projects.

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Applications are invited from people with an appropriate degree wishing to teach at graduate and post-graduate level in one or more of the following areas:

- Microprocessors, real-time systems, systems software.

Salary Scale, Senior Lecturer £2000-£27000, Entry £27522 (under review) + £150 local weighting.

Internal enquiries by telephone to Mr. J. Davis, Computer Science, extension 330.

Application form and further details available from the Staffing Office, The Hatfield Polytechnic, P.O. Box 108, Hatfield, Herts or telephone Hatfield 681100 extension 330. Closing date, 6 July. Please quote reference, 243.

Systems Engineer up to £6K

To be responsible for the design and development of hardware from specification through to acceptance and implementation. This will involve the interface of non-CTL equipment to CTL computers with the emphasis on the use of microprocessors.

Candidates, probably mid-20's, will have a Degree/HNC and 2 years' relevant experience in a computer or related industry. Digital experience highly desirable.



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The post involves working as a member of a team which is developing and supporting a number of complex and their related software environments. Duties include maintenance and testing using the Edinburgh Multi-Access System and the ICL VME/B and VME/K operating systems.

Applications are invited from graduates (or final year students) with some computing experience. The appointment, which is available from the first instance, will be on the Assistant Computing Officer scale, which is £3775-£56000 (from 1st October 1979), with Superannuation under LSS.

For further details and an Application Form, contact The Secretary, University of Edinburgh, The Queen's Building, The Queen's University of Belfast, Belfast, Northern Ireland, BT7 1NN (quoting reference 7013), to whom completed forms should be returned by 12th July, 1978.

THE UNIVERSITY OF MANCHESTER

SENIOR LECTURER IN COMPUTER ENGINEERING IN THE DEPARTMENT OF COMPUTER SCIENCE

Applications are invited for this post which is available immediately. Candidates should have a good first degree and post-graduate qualifications in Computer Engineering or some related discipline and also considerable experience in one or more of the following fields: Microprocessor design, Computer Aided Design of circuits or systems, Microprocessor design, Optical disk drives, solid state memory devices, interconnection techniques, High Density packaging and coating of electronic systems. Preference will be given to those candidates who wish to work with us on research into aspects of Semiconductor Electronics relating to computers and microprocessors and to those with interest in design and building computer type instrumentation and computer systems both hardware and software. It would be an advantage if the applicant could be expected to teach undergraduate or graduate students so the ability to lecture is essential. The salary will be in the range £12,150-£16,000 per annum. Further particulars and application form (returnable by June 28th) from the Registrar, The University of Manchester, M13 9PL. Quota ref. 1187/78/GW.

CITY AND GUILDS OF LONDON INSTITUTE SYSTEMS ANALYST SALARY UP TO £7,500

The Institute is an independent, self-financing body and our main business is the provision of schemes and examinations of a technical and vocational nature and a corresponding range of tests leading to skills qualifications. We are developing systems connected with our examination procedures using a PDP 11/34 operating under RSX11M. Programming is being carried out in BASIC +2 and MACRO II.

We are looking for a Systems Analyst to work on the above systems; he/she should have at least 18 months' experience on PDP machines (some of which could have been spent in programming).

Other systems are being developed using a bureau based IBM 3032 under OS/MVS and there may be opportunities to work on these systems at a later date.

We provide a friendly, relaxed atmosphere and pleasant working conditions. Benefits include:

Generously subsidised restaurant.

Free-call and collect.

On-call payments (where applicable).

Flexibility of working hours.

18 days (+8 Institute days) leave - pro rata 1st year of service.

50% BUPA scheme.

1st class pension scheme.

You would like any further information telephone Mike Dwyer, on 01-278 2488. Application form may be obtained from the Personnel Department, 46 Britannia Street, London WC1X 8RD.

SENIOR PROGRAMMER Up to £6,000

A vacancy for a Senior Programmer has arisen with E. Gomme Ltd., who design and manufacture G-Plan furniture.

The position involves membership of a small team writing application programs in PL/I for both batch and T.P. (SHADOW II) systems. Program development is done on-line using SHADOW/QUOTA. The successful applicant will be encouraged to develop system programming expertise.

The installation is A28K IBM 370/125 with 3330

disk, tape and VDU's and further expansion is planned.

Applicants should preferably have at least three years' experience in PL/I, RPGII, SHADOW II or System

programming experience would be an advantage.

The company is a first-class employer and will,

where appropriate, assist with removal expenses.

Write to:

Company Personnel Manager

E. GOMME LIMITED

Spring Gardens, High Wycombe, Bucks.

Mid-West USA Banking

This prestigious Banking corporation is situated at the heart of the Great Lakes amidst what must be described as breathtaking rural beauty. Their D.P. department comprises IBM 370/158, 168, 3031 + 3033 operating under OS MVS, IMS/VS.

To meet their planned expansion goals our client wishes to recruit 20 British IMS or other T.P. specialists with Database and COBOL backgrounds. In keeping with their high standards the client insists on an elevated level of competence accompanied by not less than 3 years relevant expertise.

You will be offered an initial contract of at least 1 year's duration during which time you will receive benefits commensurate with a prestigious banking organisation. These benefits include Blue Shield, Blue Cross medical insurance, paid return fares at start and mid-project, initial paid accommodation etc. Interviews will be held in London within the next month and offers made within 14 days. You will be discussing at a salary range around:

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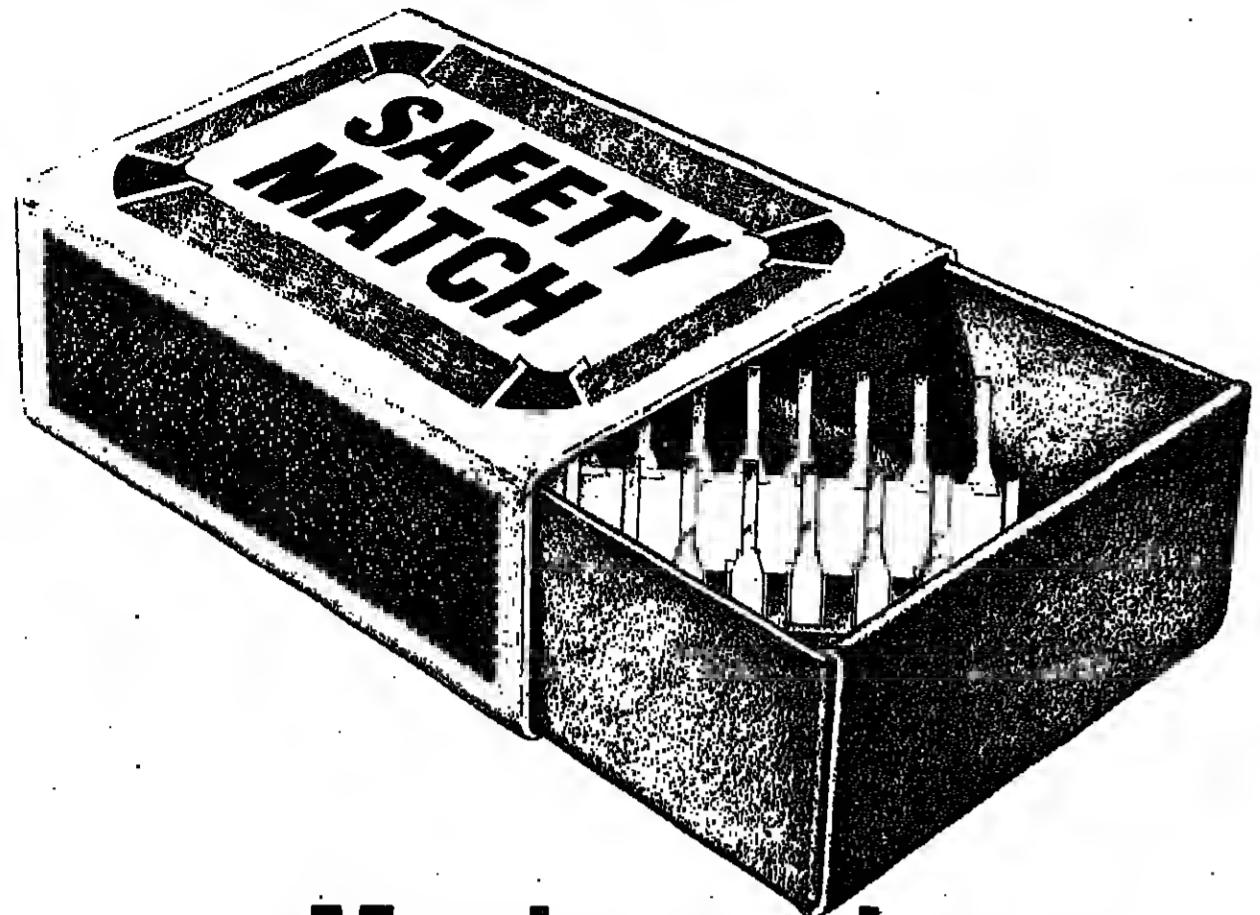
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Bring us a relevant degree supported by a couple of years in any area of computing, hardware or software (with emphasis on technological applications); prove to us that you can make a real contribution to technological development in a front-line situation; and we'll turn a lukewarm career into a very hot prospect.

We'll give you first-class training in the most advanced design techniques using CORAL, and fire your enthusiasm by giving you ever-increasing responsibility in major projects involving state-of-the-art microprocessing devices from the world's leading manufacturers.

Employing sophisticated components like Motorola 6800, Texas 9900 and Intersil 6100 singly and in networks on a wide range of defence and radar applications, you'll be given every opportunity to develop your professionalism and pioneer new

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With new data processing techniques being introduced almost by the minute, no ambitious man or woman can afford to be left out in the cold.

Your place is at the forefront of microprocessing innovation, and Marconi Avionics can put you there.

For full details, please contact Chris Hill at Marconi Avionics Limited, FREEPOST, Elstree Way, Borehamwood, Herts WD6 1BR. Telephone 01-963 2030 ext. 3449. Please quote reference MA 79090.

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Operator/ Programmer

We require a computer operator with knowledge of programming in FORTRAN or BASIC to be responsible for running, maintaining and developing a number of management and accounting programmes on a Harris S123 Computer now being installed.

Previous commercial experience is not essential.

A salary of £4,000 per annum is envisaged.

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Artillery House,
Artillery Row, London SW1P 1RX.

or telephone 01-222 7755 Ext. 307 for an application form.

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HOSPITAL

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Computer
Operator

For Chemical Pathology Dept. to work on the daily operations of an on-line computer system. The system is based on a Modular 1 Computer with disc back-up store and multiple terminals. The job offers considerable responsibility and the successful applicant will be expected to be able to work to time schedules and to adopt a disciplined and professional approach to his/her work.

Applicants should preferably have experience of computer operating in a real-time environment.

Basic salary £3000 to £4775 inc.
London Weighting. Shift allowances payable. Review pending.

Application forms and further information from Personnel Department, University College Hospital, Gower Street, London WC1E 6AU, tel: 01-387 8200 Ext. 381, quoting Ref: GW/6CO/RP.

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£7,500-£10,000

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Sound business knowledge is essential as the work not only involves the supervision of production and its quality control of the business systems being processed on our computers, but also involves detailed liaison with our clients on the use and extension of computer systems within their organisations.

All applicants must have practical experience of computer systems and a sound understanding of accounting principles.

These posts offer a wide variety of assignments and excellent career development. If you feel that you match up to our demanding yet highly rewarding standards, please write or telephone for an application form, quoting ref. S/1 to:

Trudy Allen,
CMG (Southern) Limited,
Sunday House, Bedford Park,
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Tel: 01-686 6251.

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To head a small team selling magnetic storage media for computers. He/She will start as a "one man band" and will soon have one, and later two, sales representatives under his control.

We are currently selling these products at about £500,000 per year, and look forward confidently to a substantial increase.

The successful applicant will have experience as a salesman as well as controlling a field sales force.

Salary, commission, and a company car, will make a very attractive offer. This is a position of great importance to the company, and we are looking for a high calibre person to fill it.

Please reply to Peter Rose, General Manager.
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Surrey. Tel: 01-541 4098.

Fiji

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Up to £9,230 plus allowances

Candidates must possess a relevant degree or equivalent qualification with three years systems experience, or if unqualified, have six years EDP experience in systems with a programming background in COBOL. Experience of ICL equipment, RPG II programming and on-line applications would be advantageous.

Duties will be to investigate potential computer applications, design and document systems, prepare programme specifications and supervise implementation. The officer will also be responsible for training and supervising programmers.

Salary includes a substantial tax-free allowance (reviewed annually) paid under Britain's overseas aid programme. Basic salary attracts 25% gratuity. Benefits include free passages, generous paid leave, children's holiday visit passages and education allowances, subsidised housing, appointment grant and interest-free car loan.

The terms on which civil and public servants may be released if selected for appointment will be subject to agreement with their present employers.

For full details and application form write quoting MC/605/CD.

Crown Agents

The Crown Agents for Overseas Governments and Administrations, Recruitment Division,
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1900 COBAL S. LONDON

SENIOR
PROGRAMMERS
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PROGRAMMERS
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...who can handle responsibility

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This position covers all aspects of compiling in a small department which works on a two shift system - 9.00am-5.00pm and 1.00pm-9.00pm - alternating weekly. You must be capable of accepting the responsibility for running the evening shift on your own. Opportunities exist for training in programming techniques at a later stage.

You should have relevant experience on similar equipment and be aged in your 20s.

An excellent salary will be offered with benefits which include four weeks holiday, luncheon allowance, season ticket loan scheme and a non-contributory pension and life assurance scheme.

Please telephone for further information and an application form or write with full career details to:

Howard Statham or Paul Wood,
Marathon International Petroleum (GB) Ltd./
Pan Ocean Oil Corporation,
35/38 Portman Square, London W1H 0BN.
Tel: 01-486 7211.



DORSET COUNTY COUNCIL

DORSET INSTITUTE OF HIGHER EDUCATION (Wellsdown, Poole)

Computer Manager

GRADE SO1 £5,232 to £6,568
(Inclusive of supplement)

The Computer Centre at the Wellsdown Campus of the Institute caters for educational users throughout the County of Dorset, as well as for courses run by the Institute.

You will be a member of the Institute staff responsible to the Director for the day-to-day management and operation of the Centre and will be involved in the development of the Centre. Technical staff at present consists of two reporters and one punch operator.

A detailed knowledge of computer technology and programming using such languages as BASIC and FORTRAN (probably in no education context) are essential, and you must have ability to operate an ICL 2003. Experience in managing and operating a small computer unit would be an advantage.

Removal and legal expenses in approved cases.

Application forms, returnable by July 15, 1979, and further details from Chief Administrative Officer, Dorset Institute of Higher Education, Wellsdown Road, Wellsdown, Poole BH12 5BB.

(Please quote: EO HEB 71).

LONDON BOROUGH OF WALTHAM FOREST WALTHAM FOREST COLLEGE Department of Sciences

Lecturer I in Computing Science

The post will involve teaching various aspects of Computing Science to a wide range of existing courses and the setting up of new courses. Candidates should probably have had some basic aspects of Computer Technology although people with a grasp of Mathematics coupled with a willingness and interest to enter the field of Computing will be considered.

Salary Lecturer Grade 1, £3,192 to £5,334 plus London Allowance (£327 salary review pending).

Post tenable from 1st September 1979.

Application forms and further details available from the Principal (Staffing), Waltham Forest College, Forest Road, Walthamstow, London E17 4JB. Tel: 01-527 2311, Ext: 258.

Closing date: 2 weeks from appearance of advertisement.

PROGRAMMER

We have a major development programme which involves

- * the implementation of a large branch terminal network using IBM 3600 equipment.
- * the implementation of a database system.
- * the extension of local TP using 3270's.

We need to enhance our existing team to ensure the success of this demanding programme and are thus able to offer a Programmer an exciting opportunity to extend his/her experience.

Applicants should have a minimum of two years' experience using PL/I or Assembler. Preference will be given to applicants with experience using DL/I or database system or 3600 terminal equipment.

This appointment will be based in our Head Office in Bristol. A realistic salary, which is reviewed annually, will be offered, and there are attractive fringe benefits, which include a contributory Pension and Life Assurance scheme, extended membership of BUPA/WPA and staff house purchase facilities.

Please write in the first instance with brief details of your age, qualifications and previous experience to: The Personnel Manager, Bristol & West Building Society, P.O. Box 27, Broad Quay, Bristol BS8 9AX.

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A multi-national corporation based in Southern California operating IBM 370/158's, 3031 and 3033's have retained Logistix to identify Database designers + Analysts and T.P. applications programmers especially with experience of either IMS or CICS. Programmers will be particularly qualified in the use of ANS COBOL and will either be conversant with or willing to learn structured programming techniques.

Initial Contracts will be for a 1-2 year term and will be offered to suitable applicants able to substantiate Data-base and/or T.P. skills at a technically demanding level.

In addition to highly competitive salaries our client will be providing attractive fringe benefits to cover return air fares to the U.S., paid initial accommodation, medical + dental insurance, productivity bonus etc. Our clients will be in London at the beginning of July and offers will be made within 14 days. Salaries will be in the region of:

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Applications are invited for a lectureship in Computing in the School of Economics and Accounting. The School runs a BA Economics course, a full-time Accountancy Foundation course and a range of part-time postgraduate courses.

Candidates should be graduates, preferably with relevant industrial or academic experience, and above all should be eager and willing to liaise with lecturers in other disciplines to form cohesive, vocationally oriented courses.

Salary: £3,685 to £8,680 p.a.; LI £4,578 to £7,032 p.a. (both figures inclusive of London weighting).

Application forms and further details from The Chief Administrative Officer (TD/LC), Ealing College of Higher Education, St Mary's Road, London W8 8RF.

Post tenable from 1st September 1979.

Closing date: 14 days from appearance of advertisement.

E-mail: 151

London E17 4JB. Tel: 01-527 2311, Ext: 258.

Closing date: 2 weeks from appearance of advertisement.

E-mail: 151

London E17 4JB. Tel: 01-527 2311, Ext: 258.

Closing date: 2 weeks from appearance of advertisement.

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Closing date: 2 weeks from appearance of advertisement.

E-mail: 151

PROGRAMMING TEAM LEADER

CENTRAL LONDON C. £7500

This is an opportunity to manage a small team of programmers within the programming department of a major ICL 2900 installation. Most of the work is related to new applications, including on-line, real-time and database systems.

You would be involved in:

- development of overall program design
- quality control and scheduling/monitoring of the team's work
- guidance, training and motivation of programmers
- participation in the development of code, system testing and technical problem solving

The opening will interest a senior programmer with:

- at least four years' programming experience, including sound COBOL (on any hardware)
- experience in controlling a small team, or demonstrable leadership potential
- (ideally) knowledge of one or more of the following — VME/B, large applications, real-time, database management systems

Career prospects are good (with a salary increase within six months) in an installation with a lot of development work on hand, and appropriate further training in modern techniques will be provided as required.

We have been retained by clients to recruit for this post. Please ring us in confidence, quoting ref. 841, or leave a message on our answering machine and we'll contact you.

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Required for a technical consultancy mini computer.

Experience: Previous experience on IBM 1130 systems operations or equivalent a necessity. Knowledge of Fortran IV essential, Assembler and Cobol an advantage.

The Job: Supervision of and responsibility for all aspects of computer operations. Hands-on operation of computer system and peripherals.

Running jobs and checking output. Programming and liaison with user staff for either full programming or debugging of technical programs.

The System: Digital Scientific Model 4.
32K main core.
16K auxiliary core.
Operates under IBM 1130 emulation mode.
Card reader 1000 cps, Line Printer 300 cps.
Multidisc [2] 40 megabytes, single disc.
Plotters, digitiser and tape unit, terminals.

The position requires dedication and drive with the ability to exercise initiative and anticipate job needs, be articulate and mix with all skill levels.

Salary £6 000 per annum negotiable. Fringe benefits.

Applications in writing to:
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GCA International Building
Rosemount Avenue, West Byfleet, Surrey

EDUCATION DEPARTMENT
MONKWEARMOUGH COLLEGE OF FURTHER EDUCATION
Department of Science and Technology

LECTURER I (£3192-£6334)
LECTURER II (£4101-£6588)

IN COMPUTING AND DATA PROCESSING

Applicants should have appropriate qualifications and experience. A previous qualification in Computing or Data Processing would be an advantage.

In the case of the Lecturer Grade II, applicants should have commercial experience in programming or systems analysis.

Commencing salary dependent upon qualifications and experience.

Application forms and further particulars available upon receipt of a stamped, addressed envelope, from the Principal, Monkwearmouth College of Further Education, Swan Street, Sunderland SR8 1EB.

Closing date for applications: 4th July, 1979.

L. A. BLOOM
CHIEF EXECUTIVE

Borough of Sunderland

IBM COBOL PROGRAMMERS CENTRAL LONDON

PROGRAMMERS TO £6,500

SENIOR PROGRAMMERS TO £7,500

For Development Work In Project Teams

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International Statistical Institute World Fertility Survey

FURNESS WITHY SHIPPING

We are an international shipping organisation, part of the Furness Withy Group of Companies. Our recently-formed computer department, currently operating on I.C.L. 2904 in London and remote 7502s, is embarking on a number of new, major projects which will form an important and integral part of the Group's business operations. We are building a carefully selected team of experienced professional computer staff to define and subsequently develop the variety of systems required by a Group of this standing and there is now an opportunity for three experienced staff to join our team.

SYSTEMS ANALYST

CIRCA £7,000 PER ANNUM

LOCATION—LIVERPOOL (PACIFIC STEAMSHIP NAVIGATION COMPANY)

You will have a demonstrable record of achievement which will include project responsibility for the design and successful implementation of a major new system. Whilst previous experience in the shipping industry would be advantageous, it is not essential. Applicants must, however, be capable of working effectively with all levels of user management and staff and should have a programming background. The successful applicant will work in Liverpool as project controller of a mini-computer-based freight documentation system.

SENIOR PROGRAMMERS

CIRCA £6,500 PER ANNUM

LOCATION—CITY OF LONDON

You will have at least three years' programming experience in Cobol and R.P.G. and will have been involved in the design and implementation of at least one major system. Experience in a communications environment would be a distinct advantage. As part of a small team you will have a leading role in the design, writing and implementation of programs.

For the right people career prospects are excellent and they will be encouraged to contribute to the data processing plans of the organisation.

Fringe benefits include B.U.P.A., subsidised staff restaurant, interest-free season-ticket loans and contributory pension scheme.

For further information contact the Computer Manager on 01-481 2020 (ext. 2814) or write, in complete confidence, giving relevant details of age, qualifications and experience to: Mr. F. W. Wansbury, Personnel Manager, Shew, Savill & Albion Limited, 52 Leadenhall Street, London EC3A 2BJ.

SYSTEMS PROGRAMMER

The organisation: WFS provides back up and support to a worldwide programme of population research. It is based in London but financed by international agencies. The professional staff of over 50 people include demographers, statisticians and data processing experts from 14 different countries.

The hardware: An HP3000 (II) with ½ mb of store and 350 mb of disc. All work is done through on-site terminals.

The job: This is a new post to support the work of an existing systems programmer. Most of the load on the computer is related to data analysis and data archiving and the systems programmers ensure that the basic software is maintained and developed as appropriate and provide technical advice to the general users. Technical assistance to developing countries may possibly be assigned as well, requiring occasional overseas travel.

The qualifications: The ideal candidate would be a graduate with a general computer systems background of several years (preferably with HP3000 experience) and some acquaintance with statistical data processing. A second language (French or Arabic) would be highly desirable.

The rewards: WFS occupies pleasant offices in a useful corner of London.

We offer the successful candidate a challenging opportunity in an international environment with a salary of not less than £9,000 per annum.

Send curriculum vitae to:
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Data Logic operates at the forefront of computing, applying the very latest hardware and techniques to practical commercial problems. We cover the range from mainframes to the smallest computers. We are leaders in the use of microprocessors for applications that not so long ago required far larger machines.

Many of the systems we supply go far beyond providing extra speed and cost savings. They will revolutionise the way the user organisations operate. Several projects involve dispersed networks of ten or more minicomputers. Our largest turnkey system incorporates twenty-three machines and close to three hundred display terminals across the country — a totally new system which will serve almost every function within a leading company. A new police contract involves the first use in the UK of a mini for a complex data retrieval

application — with our own advanced methods for rapid, generalised record searches.

The exceptional scope and quality of work is important to our staff. We can match their individual experience to their projects. Equally, we can ensure that each project adds to their experience. As computing itself develops, so do they.

Over the past year Data Logic has grown dramatically in size, in scope of work and in reputation. Our expansion has meant unrivalled opportunities for career progression. We are not prepared to promote people before they are ready for it. But when they are ready — and we give all the assistance we can — the positions as senior programmer, senior analyst, project manager and consultant will be there waiting for them.

The reason is simple. We know that we are successful only if our staff are.

Programmers

(Ref PS/33/CW) For both mainframe and minicomputer projects which include commercial applications, monitoring and control, and scientific analysis.

Applicants should have at least 18 months programming and/or analysis experience in high-level language or assembler on any leading mainframe or minicomputer.

This is an outstanding opportunity to gain experience in the development of complex high performance software. Our programmers work in small teams, taking considerable responsibility for distinct areas of the total system.

Salaries will be highly competitive. Vacancies exist at our Greenford, Birmingham and Manchester offices.

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Data Logic Limited
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Our client's computer installation is expanding rapidly with the acquisition of new hardware. Extensive systems development being carried out has created a number of very interesting operations positions for persons able to offer two years', or more, experience of operating IBM 370 hardware in a DOS/VS environment.

The present configuration comprises a 370/138 running under DOS/VS POWER/VSE and four major real-time systems are currently being developed to run on a newly created network of DEC PDP11 computers. The persons appointed, therefore, will be keen to progress their careers and will demonstrate an ability to learn and adapt swiftly to new techniques in a busy environment.

A three shift system covering five days a week is in operation. The company offer valuable bonus schemes and a good base salary comprising a package which may be in excess of £5100 and, as one of Europe's major motor manufacturers, they also offer an exclusive discount car purchase scheme.

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Specifically you will be supporting our George operating systems and DME using 2904, 2900 and 1904S machines. You will be the Centre's technical expert in this field, with about half our operating systems under your control.

As well, naturally, as your responsibility for timescales and budgets, we shall expect you to keep the service developing and expanding. Your heavy involvement with both internal and external customers will call for considerable skill in providing technical advice

and assistance. You will provide leadership for a small team in which you will need to foster and maintain a high degree of expertise.

We are looking for someone with a solid background in GEORGE 3 including both operations and programming experience.

Career prospects are excellent. This appointment, for example, could lead to that of Systems Support Manager or senior programming or contract work anywhere in our organisation.

The salary will be in the region of £7000, and you would be eligible for our 1979 Productivity Bonus Scheme. We will also help with relocation expenses to the Reading area where appropriate.

Please contact Mick Smith, Manager, DataSkill Systems Centre, ICL DataSkill, 128-130 Cardiff Road, Reading, quoting reference CW1413. Tel: Reading (0734) 582041, at any time.

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As the leading computer recruitment consultancy in Essex, we have many interesting and challenging positions on our books in both Essex and London. Here are just a few:-

CITY**SYSTEMS ANALYSTS**

to £8,500

PROGRAMMERS

to £7,000

SYSTEMS PROGRAMMERS

to £7,100

Our client, a multinational company, have a large IBM installation and are looking for persons with sound experience in the above listed disciplines. For all these vacancies IBM mainframe experience is required. Systems Programmers must have a sound Assembler background. Application Programmers must be conversant in PL1 and/or Assembler. Systems Analysts must be experienced in commercial applications. Basically you must be good. Are you?

For more information about any of these permanent positions, plus many of the other interesting opportunities we can offer you, phone Martin Walton on:

BRENTWOOD (0277) 212021

or write to him at LINSCOTT COMPUTER SYSTEMS LIMITED, P.O. Box 74, BRENTWOOD, ESSEX CM15 0B7.

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LINSCOTT
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CLASSIFIED COLUMN WIDTHS

Artwork, PMT's and Film etc. are still being supplied oversize, as this places considerable extra work on our printers process department as well as changing page layouts.

Advertising agents are reminded our column widths are as follows:

SINGLE COLUMN 38mm (9½ ems)
DOUBLE COLUMN 82mm (19½ ems)
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For further details contact David Abbott, 01-261 8016

ESSEX**PROJECT LEADER**

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Publicity Author**Industrial Computer Systems £4075 to £6442 and Bonus**

We are seeking an experienced and energetic technical writer whose primary task will be to write and produce a continuous output of high quality technical brochures and leaflets. All aspects of literature production are involved, from initial planning and collection of technical information to preparation of copy and the supervision of photography, design and printing. There will also be opportunities to participate in related publicity activities such as exhibitions, advertising and public relations work.

Applicants, male or female, should be able to produce evidence of successful commercial writing, preferably in the fields of electronics, computing or control systems. They should also have sufficient technical background to be able to collect information by discussions with senior designers, assess its relevance and recognise points requiring deeper investigation.

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Ring David Abbott for further details on 01-261 8016

Cable and Wireless UK Services Ltd, a company within the worldwide Cable and Wireless Group, design and install a wide range of telecommunications and data processing systems. We are currently launching commercial Data General mini-computer systems to both large and small organisations with all types of applications, and due to phased expansion now require the following staff:-

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Promotion prospects are excellent and company benefits include regular salary reviews with cost of living allowances, season ticket loans and an excellent pension scheme.

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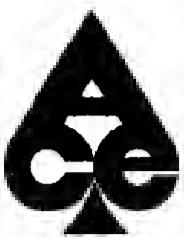
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Of course, if you already know RPGII or have a knowledge of system design and the ability to deal with users, then we would particularly like to hear from you.

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Two + years of commercial applications design and implementation in Accounting/Financial/Insurance or in Sales Order Processing/Stock Control/Production areas. Technical background preferred. Compensation to £7K.

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to take responsibility for permanent appointments in the North and Midlands based in centre MANCHESTER. Previous computer recruitment experience and an established successful record in the business is essential. Success could lead to a senior appointment and equity participation in the company.

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Our Directors want to discuss these opportunities with you, informally but in complete confidence, if you have relevant recruitment and/or sales experience, together with the energy and purpose that they demand. Please telephone initially.

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A Sales and Marketing Services Company

Established 1969, Head Office: 40-42 Wigmore Street, London W1P 8AF

Telephone: 01-580-3754

Fax: 01-580-3754

E-mail: CAPP@BT.COM

WWW: CAPP.ORG.UK

Computer Operators & Trainee Computer Operators

The Central Electricity Generating Board has a number of vacancies for Computer Operators, and Trainee Computer Operators at its Headquarters Computing Centre located at 89 Park Street, London SE1 9PL.

The computers currently in use consist of:

- 1- IBM System 30 Model 1040, operating under MVS/VSE
- 1- IBM System 30 Model 1041, operating under MVS/VSE
- 1- IBM System 30 Model 1043, operating under MVS/VSE
- 2- ICL 1990, operating under CPM/RAS/PSP

Both Models 104's have an extensive magnetic disc and tape sub-systems and other peripheral devices. The central computers are operational seven days a week, and are maintained by 6 shifts of operating staff.

Applicants for the initial Computer Operator must be over 18 years of age and should possess GCSE 'O' levels or equivalent qualifications, together with at least one year's operating experience, or, if they fit in at a large computer installation, longer. Details will also be given to those over 18 but without experience for appointment as a Trainee Computer Operator.

The salaries for these positions will be dependent upon experience and will be within one of the following ranges:

COMPUTER OPERATOR £3721-£4987 per annum inclusive

TRAINEE COMPUTER OPERATOR £2820-£4081 per annum inclusive

Applications should include relevant details and present salary to the Group Personnel Officer, C E G O, Sudbury House, 15 Newgate Street, London EC1A 7AU, by 28 June 1979. Quota Ref SLP/190.

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If you are confident that you could make a significant contribution within DIGITAL'S Sales Organisation, please send your resume to:

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Personnel Executive

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To run a dynamic training team. He will be responsible for preparing and carrying out the training sessions in Paris and abroad, and will take part in all other activities concerned with technical information for the personnel.

The applicant should have:

a liking for teaching and the corresponding aptitude, a good background knowledge of computer science and telecommunications.

a University degree or equivalent.

A good knowledge of French is essential. Spanish would be appreciated.

Please write giving full career details to:
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Even at Section Leader level, too many people in too many companies spend too much of their time on coding and documentation. And not enough on original, creative thought.

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New York USA IMS+Distributed Processing

A major food processing corporation pleasantly situated 45 minutes from down-town New York requires Applications + System Programmers, Analysts and Systems Designers for both their IBM 3033 (OS MVS) and System 34/38 departments. The main-frame personnel will work on projects involving IMS DB/DC + COBOL. Sophisticated debug facilities including TSO are available. The system 34/38's under COBOL or RPG II are dedicated to advanced distributed processing applications covering 25 plants and 15 distribution centres.

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They offer Systems Analysts and Programmers with a minimum of two years experience, free accommodation and travelling, generous assistance with schooling (there is a British Primary School in Amsterdam) and, as they are based in Amsterdam where English is widely spoken, there is no language barrier and you are only an hour's flight away from England.

Salaries will be:

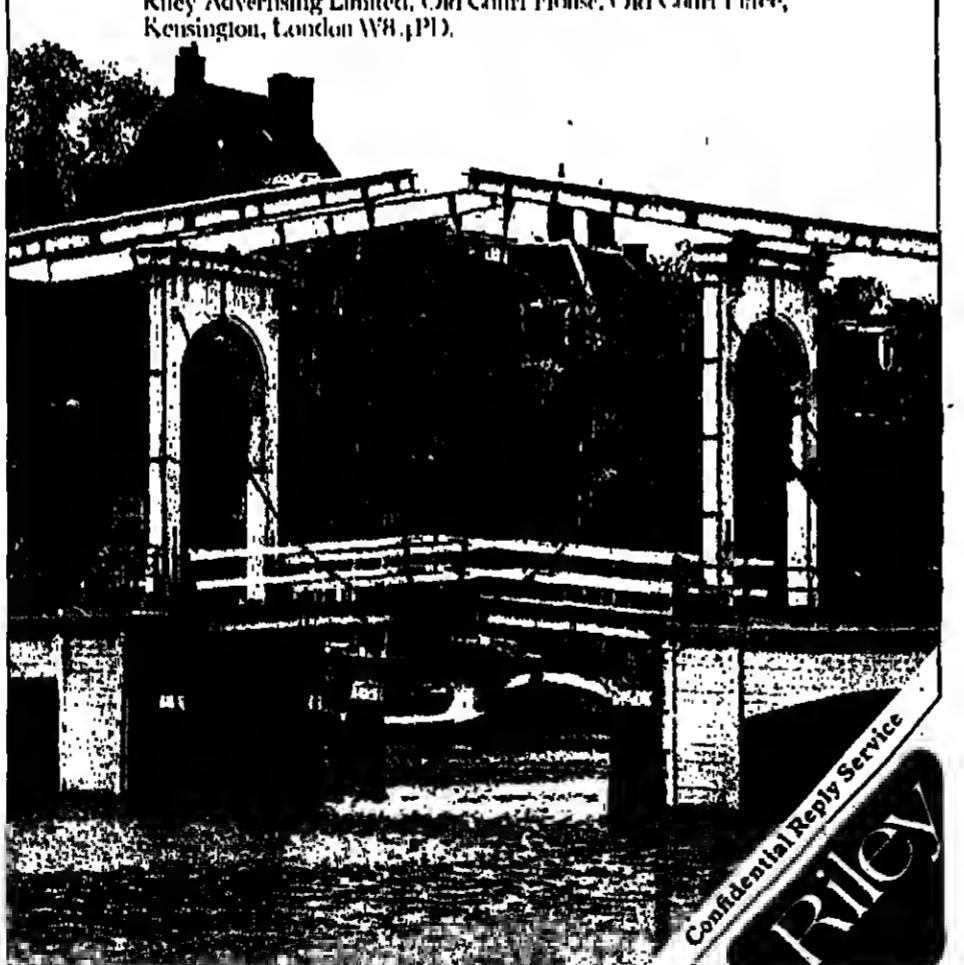
Programmers

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Further details and application forms, returnable within 14 days of the appearance of this advertisement, are available from the Principal, Stevenage College, Montebello Way, Stevenage, Herts SG1 1LA. Tel: 01-727 1229. This is a non-smoking post. All previous applications will be considered.



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£145 - £245-£3073 (including supplement)
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SYSTEMS ANALYSTS AND PROGRAMMERS

The City Council has decided to replace its ICL 1904S (192K) computer by an ICL 2960 (2Mb) in November 1979 followed by an ICL 2972 (4Mb) in January 1981. During this period both D.M.E. and V.M.E./8 will be in use and it is proposed to increase existing communications facilities, including on-line development, end to expand database facilities rapidly. Applications are invited for the undermentioned posts to assist in this transition programme. ICL 2900 experience, although desirable, is not essential as a comprehensive training scheme will be introduced.

SENIOR SYSTEMS ANALYST

Post - £6060-£6702 (including supplement)

Should preferably have at least four years' experience in the design of computer systems and be capable of accepting a high degree of responsibility for the successful completion of major projects.

SYSTEMS ANALYSTS

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To work under the general control of a Senior Systems Analyst on the development of new systems and the conversion of existing systems. Preference will be given to applicants with at least two years' experience in the design and implementation of computer-based systems.

SENIOR PROGRAMMERS

SO1/2 - £6232-£6500 (including supplement)

Several years' programming experience in Cobol are required. Must be capable of supervising other programmers within a project team. A good working knowledge of George 3 will be an advantage.

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PL4/CW. If more convenient please call Birmingham (0242) 72299

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